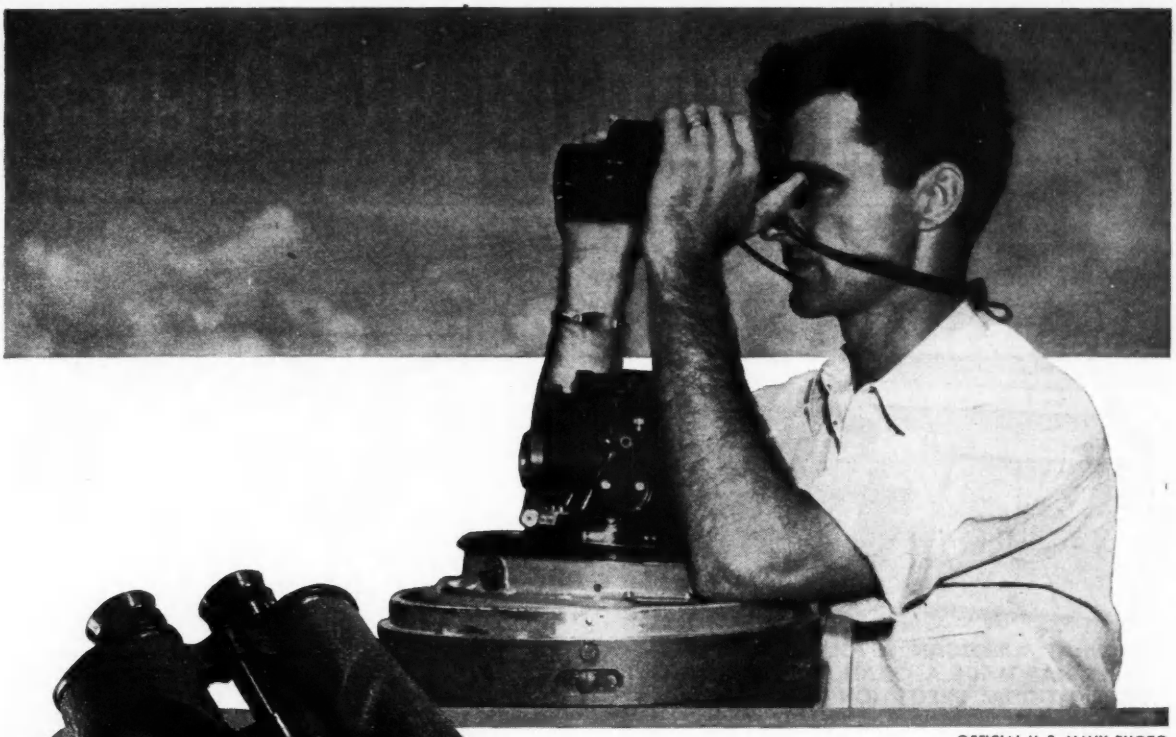
THE AMERICAN RIFLEMAN

25 CENTS

FEBRUARY 1945

MUDDY-BOTTOM RIFLE
BIG MATCH TO-NITE!
MAKE A POSSIBLE WIN A WAR BOND
LOOKS LIKE PETER AND SLIM ARE OUT IN FRONT TONIGHT! THEY'VE EACH GOT ONE MORE SHOT TO MAKE FOR A POSSIBLE — AND A BOND!
GOLLY, HIS HOLD IS STEADY!
STOP SWEATING, PETER. HE'S A TOUGH MAN BUT YOU CAN TIE HIM!
SLIM
MUDDY BOTTOM RIFLE
YOU NEXT, PETE, AND KEEP CALM! THERE'S A WAR BOND AT STAKE!
KILL THE GALLERY, GIDEON! I'M SHAKY ENOUGH AS IT IS!
AND AFTER THE TARGETS WERE MARKED —
GOLLY, WHAT DO WE DO NOW? PETER AND SLIM BOTH GOT POSSIBLES!
REACH IN YOUR JEANS, BOYS. IT'S UP TO US TO BUY ANOTHER BOND!
GEE, FELLAS, GREAT SHOOTIN'. HOW'D YOU DO IT?
THAT'S EASY! WE BOTH SHOOT PETERS POLICE MATCH*!
PETERS
Rifle and Pistol Ammunition
PETERS CARTRIDGE DIVISION, Remington Arms Co., Inc., Bridgeport, Conn.
* "Police Match" is a trade mark of Peters Cartridge Division
POLICE MATCH
POLICE MATCH
Ammunition



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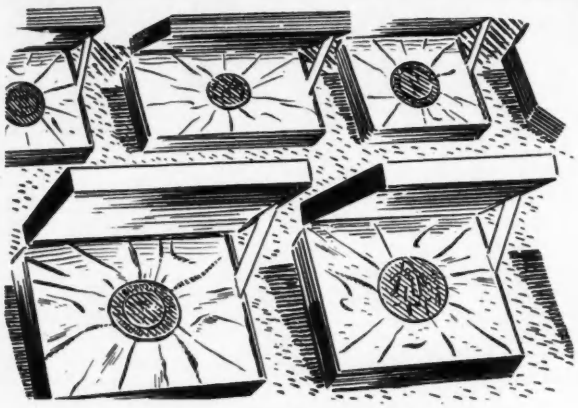

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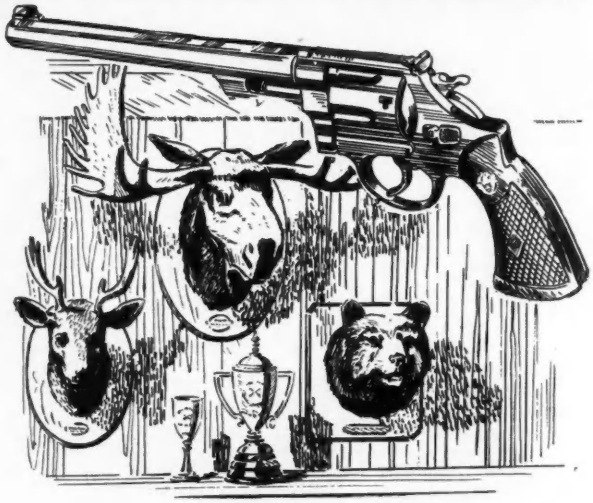

Q: WHAT HANDGUN FIRST QUALIFIED AS A REALLY EFFECTIVE BIG-GAME WEAPON?

A: In 1935, Smith & Wesson designed its famous ".357" Magnum Revolver—and carried handgun ballistics into the rifle class. The Magnum has successfully produced clean kills at ranges up to 500 yards on almost all types of big game, including Moose, Leopard, and the great Alaskan Kodiak Bear.

WATCH
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SPRINGFIELD 2, MASS.
FOR FIRSTS IN FIREARMS

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FROM THE PROVING GROUNDS OF TODAY'S BATTLEFIELDS — GREATER GUNS FOR YOU TOMORROW

An Editorial

Universal Military Service

ONE question bothering many Americans in connection with discussions of "universal service" is, "What *kind* of universal service are we going to legislate?" From the military comes the response, "That is a silly question. 'Universal service' can only mean universal *military* service!"

But the question is *not* silly. Both Mrs. Roosevelt and the President have indicated in statements to the press that "universal service" might mean many different kinds of service to the Nation—a revival of the CCC, or some similar plan involving a sort of labor battalion idea, training for the Federal Civil Service, etc., in addition to actual military training. Certain types of educators, religious leaders and sociological visionaries have taken up the idea. As a consequence, many Americans who would favor compulsory military training are beginning to look askance at the "universal service" idea.

"Double talk" has been the politicians' favorite shield and weapon since time immemorial. Despite his denials, Franklin Roosevelt is as gifted in the language as any of his predecessors or contemporaries. His history indicates that he sincerely believes in an adequate American military and naval establishment. It is most probable that his reference to many possible kinds of "universal service" was meaningless "double talk" intended to sugar-coat the pill of compulsory military training.

If "universal service" *does* mean compulsory military training, why try to sugar-coat the pill? To whom need the Nation's leaders apologize for a return to that basic principle on which every true democracy has been founded—the principle that every citizen who wishes to enjoy the privileges of a democracy must be willing to give military service in the defense of that democracy? The overwhelming majority of Americans at this time favor compulsory *military* training. They are opposed to compulsory training as bricklayers, foresters, government clerks, dam builders, or canal diggers. The cold, hard facts of war do not blend well with the warm, soft theories of social experimentation. Americans want universal *military* service. They do *not* want some vaguely defined "universal service" which may become the plaything of a group of starry-eyed theorists or the tool of shifty-eyed political opportunists.

It is the plain duty of the President and of the majority and minority leaders of both houses of Congress to dissipate the fog of uncertainty, to stop mouthing "universal service," and to decide *now* on the clear-cut issue—Do we or do we not want universal *military* training.—C. B. L.

EDITOR'S NOTE: *The above was written prior to the President's surprise call for a "work-or-fight" bill which, in some quarters, is* also *called "universal service" legislation. Prior to the November elections, the President and most of the leaders of his party refused to sponsor work-or-fight legislation and denied the need for it. Our own editorial position on "work-or-fight" was made clear in our issue of February, 1944, and remains unchanged, regardless of elections!*—C. B. L.

The AMERICAN RIFLEMAN

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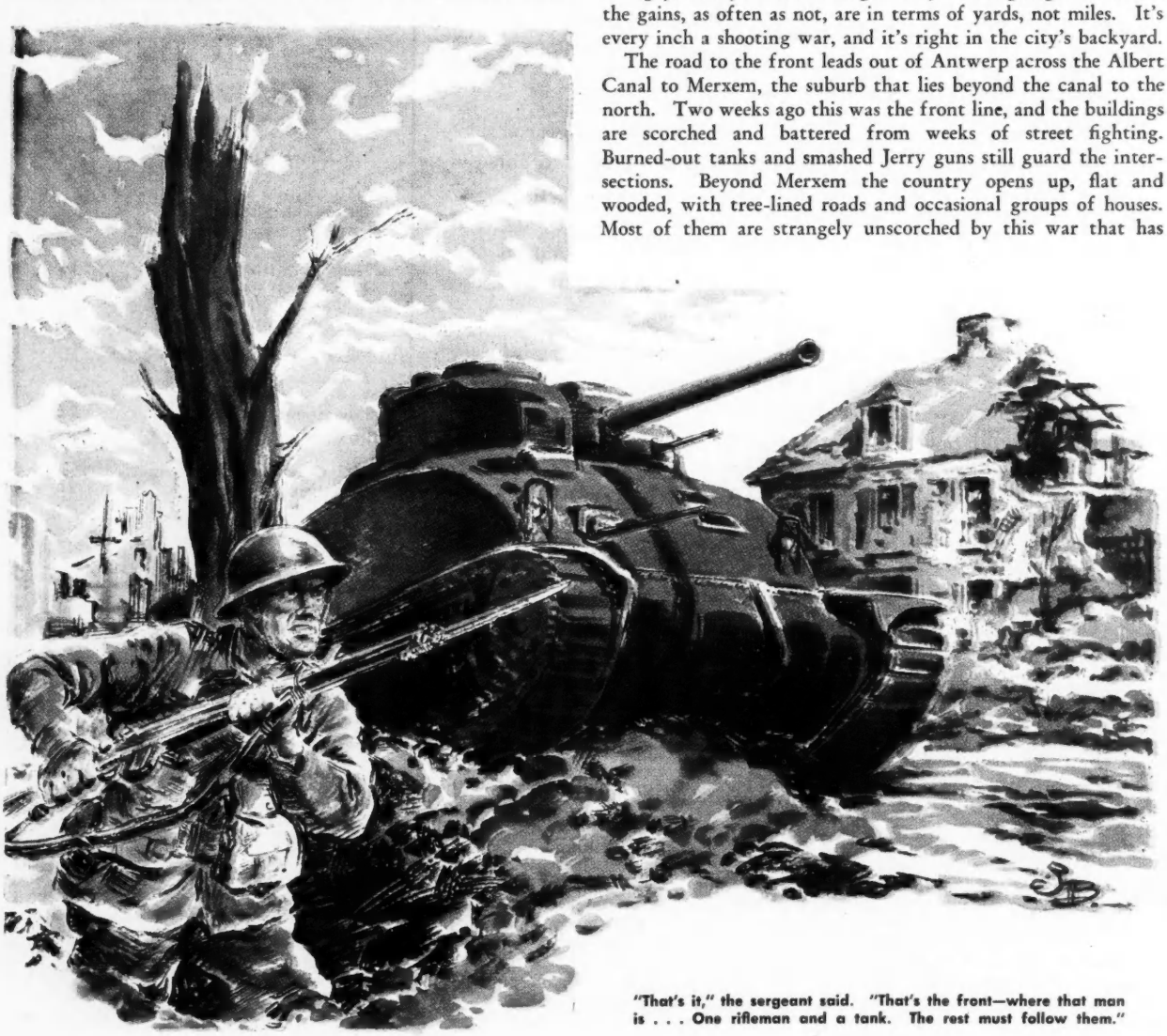
"It's a STRANGE WAR..!"

By LT. JOHN SCOFIELD

WITH THE CANADIAN FIRST ARMY IN BELGIUM, OCTOBER 21—It's a strange sort of war when an infantryman can crawl out of his foxhole, walk back a mile or so to the end of the trolley line, and be in a night club in another half hour! But that's the way it's done in Antwerp today. Here in northern Belgium, where the Canadians are doggedly pushing Jerry back over the Dutch frontier, the battle lines are only a few miles out of the city. By the time you read this, things will be different; but, today, a uniform and a nickel's worth of francs are all you need to get up to the front lines. Or a jeep and a gallon of gas will take you out to where the fighting is and bring you back to your hotel in time for a cocktail before lunch.

But it's war, bitter and deadly. At night in Antwerp you can stand at a bar and, when the orchestra takes a rest and the talk dies down, you can hear the rumble of the Allied artillery. The Germans are fighting stubbornly for every square foot of this salient that loops down from the border of Holland toward this gay, newly liberated Belgian city. The going is slow and the gains, as often as not, are in terms of yards, not miles. It's every inch a shooting war, and it's right in the city's backyard.

The road to the front leads out of Antwerp across the Albert Canal to Merxem, the suburb that lies beyond the canal to the north. Two weeks ago this was the front line, and the buildings are scorched and battered from weeks of street fighting. Burned-out tanks and smashed Jerry guns still guard the intersections. Beyond Merxem the country opens up, flat and wooded, with tree-lined roads and occasional groups of houses. Most of them are strangely unscorched by this war that has



"That's it," the sergeant said. "That's the front—where that man is . . . One rifleman and a tank. The rest must follow them."

moved by them. Along the trolley line that leads toward the Dutch border the trees have been felled for roadblocks, and only the stumps line the sidewalks. As we went forward, a steady stream of traffic flowed by us in both directions—tanks moving up, civilian trucks, lorries jammed with men and supplies, armored cars, strings of Bren gun carriers setting out on patrols from the regimental CP hidden in the woods on the left.

Lieutenant Bill Christian, of Birmingham, Alabama, had been this far before. "There was a sign here yesterday," he said. "It said, 'Stop—ENEMY BEYOND THIS POINT.' The Jerries must have moved on. Too hot for 'em, I guess." Everywhere about us were signs that the Germans had moved back in a hurry.

Another mile north we came to a crossroad. Here were a half-dozen houses, battered and cracked by artillery fire. Canadian enlisted men stood in the doorways and windows. A trolley, once bright yellow but overturned now and fire-blackened, sprawled on one corner. The air was filled with smoke. Canadian engineers were moving up behind the infantry, blowing the mines and booby-traps Jerry left behind. Standing in the road was a medium tank with its engine running, and beside it an armored car. The Canadian lieutenant in charge showed us a map of the area.

"Things are pretty quiet here now," he said, He ran his finger along the red line that indicated the road we were on. "We're here, at this crossroad. Over there, three or four miles, is the Dutch border. The company is a mile or so up."

Someone yelled over at us. "Here, quick, behind the tank," the lieutenant said. We crouched under the tank for a moment and one of the engineers pushed a plunger. A dozen Teller mines, collected from the track bed of the trolley line, exploded in a hole across the road. Stones and dirt geysered into the air and rained down around us.

"Come on up," the lieutenant invited. "I'm going along now. Follow in your vehicle, if you want." We climbed back into the jeep. The lieutenant called back to us. "It's okay for another mile."

As we moved up behind the lieutenant's armored car the road narrowed. On the left was a thick wood, fenced in, with signs nailed to the trees every few yards that had the word "*MINEN*" on them, and a skull and crossbones. On the right

John Scofield, Associate Editor and Consultant on Historical Weapons on staff of this magazine, now with an Infantry Division somewhere in Belgium, writes a starkly realistic, matter-of-fact description of one phase of this many-faceted war; a phase in which crowded night clubs are just a short streetcar ride from the foxholes—and where a "company front" is only one man wide!

the trolley line, then a ditch and a flat expanse of scrub pine. The road stretched away ahead of us as straight as a ruler. When we had gone the mile, we stopped.

"They've moved up," the lieutenant said. "This is tough country to fight in," he added. "We have to stay on the roads, and the Jerries cut back through that scrub and hit our flanks."

We moved off again. Beside us now in the ditch infantrymen were moving up. In single file they walked along the knee-deep ditch, rifles with short bayonets fixed, two grenades slung on their belts dead center, where they could get at them in a hurry. They carried packs and mess gear, and entrenching shovels were slung across their backs. We went beyond them and stopped beside an armored car parked under the trees beside the road. A radio operator sat in it, headphone on. Half a dozen men lolled about on the ground or leaned against the trees. They all looked bored.

The lieutenant asked if there had been any activity in the last few hours. The company sergeant-major waved an arm toward the scrub pines on the right.

"We flushed a bunch of Jerries out of there about an hour ago," he said.

The lieutenant introduced us. "Americans," he said. "Take these fellows up to the company commander." He shook hands with us and got back into the armored car. "See you at the crossroads," he called.

. . . . "This is a tough country to fight in," the Lieutenant said.

The sergeant-major took charge of us. "I can take you up, if you say so," he offered. "There's the major, up there in the ditch." He pointed up the road to where a tank squatted fifty yards beyond us. Beside the tank a line of men crouched in the ditch, and more were moving up to them, stooping and crawling to keep their heads below the level of the road.

"That's it," the sergeant-major said. "That's the front, where that first man is." He looked at us and grinned. "It's all right," he said. "You're safe here. It's quiet right now."

It was an odd, uncomfortable feeling, standing there on the road in the open while the infantry moved up beside us. We walked toward the side of the road with the sergeant-major.

"Look, up there," he said. "That's the objective, that house."

Off the side of the road, 300 yards or so up, we could see the red of a brick wall showing through the trees.

"It's another crossroad," he said. "Wuestwezel. If we're lucky you may see it in the communiques in a couple of days."

Beside the tank a man crawled out of the ditch and stood up. Erect now, and in the open, he walked back toward us. It was the major. As he passed he called over to the sergeant-major.

"A lot of nothing going on up there now," he said.

"How long do you think it will take to get that crossroad?" I asked the sergeant-major.

"Depends," he said. "Half an hour, an hour—if we're lucky. It depends on what we run into. You can't tell what you'll hit until the shooting starts. An hour, if it goes well. Could be five or six days though, if Jerry gets tough."

"You have to stay on the roads?" our driver asked. He was Sergeant Harold Leeds, of San Francisco.

"Hell, yes! Off in that stuff you can't do a thing." He nodded toward the pines. "You can't see for five yards out there. It's slow going, having to keep to the roads. You know, you can really only fight one man this way—the first one in that line." He pointed to the single file of men crouching in the ditch. The lead man was abreast of the tank. "They have

to keep down, and the first one is the only man who can see. It's slow going, this way. One rifleman and a tank. The rest can only follow up.

"It would be a damn sight slower without those tanks, though," he said. "We get wonderful support from the tanks. They're always right with us. The roads may be mined but they take the chance."

We walked back to the armored car. While we stood beside it the tank ahead of us opened up. A three-inch shell roared straight down the road toward the brick house at the crossing.

The leaves danced crazily in the blast and a cloud of smoke drifted into the woods. Nothing happened. The tank fired another round. Still no answering fire. We could hear the tank's engines warming up and in a moment it moved, slowly at first. The men in the ditch started again their slow crawl forward, crouched, rifles and Bren guns alert. Another fifty yards and the tank stopped. After a few minutes the major came toward us again.

"Nothing doing," he said. "We're digging in for a while."

Off to our right, machine guns and small arms began to chatter. "Something popping over there," the major said. We could hear the boom of heavier stuff, too; artillery.

"That's ours," one of the men said, with that ability fighting men have for identifying weapons by their sound. "Seventy-fives," he added.

There was the low, soft whistle of mortar fire and then the quick double report, BAMBAM, as two of them landed.

Ahead the infantrymen were digging in beside the tank. As we left, more tanks came up, and we passed a crew of engineers who probed under the tracks and between the ties of the trolley line, hunting out German mines. It was still afternoon but the sky had clouded over and there was a cold wind.

Back in Antwerp last night, the war was very far away. We were at the Follies. It was nearly ten o'clock. The bar and the dance floor were crowded and the air was hot and thick. On the orchestra stand five men were playing; civilians in tuxedoes, and a Canadian major in battle dress at the drums. He had a wide, happy grin on his face and the sticks beat out a confident rhythm. Beside us another Canadian officer urged him on. The civilian drummer, dispossessed, stood on the edge of the floor and glared unhappily. After a moment the civilian drummer disappeared and came back with five British MP's. A hurried consultation. Worried frowns. The MP sergeant listened.

"Look," the Canadian beside us said. He pointed his glass at the major, who played on, unconcerned. "He used to play with Jimmy Lunceford. Professional drummer. He's just out of the front line and he wants to play those drums. Been bothering me for a week to get here. Dammit, a man ought to be able to play a drum if he wants to."

The MP sergeant laughed. "Hell," he said. "I thought there was some trouble here. Good night, sir."

When the MP's had left the Canadian turned to us.

"It's hard to believe, isn't it?" he said. "There's a war going on ten or twelve miles from here. Hard to believe! Good Lord, this morning I was . . ." The orchestra drowned the rest.

Today the Canadians will probably get the brick house and the crossroad—if the going isn't too tough. And if it isn't too tough there'll be another house this afternoon or tomorrow, and a few hundred yards more of that road. Maybe a couple of miles if they're really lucky. If the going gets rough, it may take five days or a week to take that brick house you can see if you stand by their armored car.

That's the way the war goes. A few hundred yards closer to Germany . . . a strip of road . . . a little group of broken-up houses. And tomorrow the communiques will say, "*Minor activity on Dutch border*"—if they mention it at all. ◆ ◆ ◆

SIX POINTS OF DEER POLICY

SEVENTEEN EXPERTS on deer control from almost as many states met at the Wildlife Conference in Chicago and compared notes. Most of them had never seen each other before, but all had wrestled with excess deer problems in their respective states. Somewhat to their own surprise, they found themselves in unanimous agreement on six points of policy:

1. If excess deer are not shot off they will starve off. When a herd starves down, the carrying capacity of the range drops.

2. A herd can be reduced effectively only by killing females. Where large refuges exist, they sometimes must be shrunk before a reduction can be made.

3. The sooner excess deer are removed, the more deer the range will carry later. Reduction should be completed before starvation begins.

4. The following experiences shed light on the degree of reduction needed:

(a) A 90 per cent starvation on the Kaibab brought partial range recovery.

(b) Pennsylvania has reduced 50 per cent by doe seasons, but cannot yet plant white pines. Some red pines are getting by.

(c) On the Dixie Forest in Utah a 50 per cent reduction by shooting seems to have brought some relief, but this herd had not reached the starvation point. Other Utah herds are in process of combined shooting and starvation, but no conclusions can yet be made.

(d) Michigan's deer are starving down because the legislature would not authorize killing females. The extent of the reduction is unknown. Range conditions are getting worse.

(e) Assuming a deer population of 500,000 Wisconsin has reduced its herd temporarily 26 per cent by shooting 66,252 males and 62,044 females (taken in the 1943 hunting season) without relief to the range.

(f) In average years annual losses of deer in overpopulated areas of Texas vary from 15 per cent to 26 per cent, and in dry years some herds have suffered losses up to 50 per cent.

(g) In Minnesota open seasons, without age or sex restrictions, in four of the past six years have failed to check the increase of deer. There have been starvation losses in some places in recent years and range deterioration is evident.

5. Delay in removing excess deer deteriorates their physical vigor and predisposes to parasites and disease.

6. Predators may be useful in breaking up congestions, and in helping to control deer in inaccessible areas, which hunters cannot or do not reach. Excess deer are a problem in distribution as well as numbers.—*Reprinted from WISCONSIN CONSERVATION BULLETIN.*

PISTOL CLASSIFICATION

By WARRANT OFFICER C. A. "SMITTY" BROWN

THE ONE SERIOUS DAMPER to the rapidly growing popularity of handgun competition is the present classification system which places the comparative tyro on the fifty-yard line in registered competition.

Not even a considerable amount of instruction and practice will ready the average handgun shooter for Slow-Fire-at-fifty-yards, Timed-and-Rapid-at-twenty-five-yards shooting. That course is tough enough for the Masters! The average beginner, having failed several times to make gratifying scores at these ranges, having suffered several times the embarrassment of seeing his name far down the list of shooters all of whom, according to present classification, are in his own class but many of whom are actually far beyond him in experience—the average shooter says, "Well, I guess I'm just not cut out to be a pistolman," and drops quietly out of handgun competition.

That man is lost forever to the handgun game. And the sad part of it is that he was lost, not because of any fault or lack of ability in himself, but because of a fault in the game; a fault that could be *and has been* effectively cured by a simple change in the classification system.

The aim of all classification of competitors, in all sports, is to enable players to compete against players of their own caliber. An ideal system of classification would be one that would grade competitors so accurately that players in the same "grade" could invariably play against each other with no wide discrepancies in their abilities. Proper classification in any sport should give all players a fair chance to win against other players of equal advancement.

No such ideal end is achieved in handgun competition under the present classification system. Note the wide discrepancies between the winning scores and the "tailenders" in any class in any registered shoot.

Yet accurate classification of handgunners is possible. Such a classification system has been used for two years past at Quantico, Virginia, in the training of Marine shooters. The same system was devised and used for years prior to the present war, and is still in use, by the Florida West Coast Pistol League.

Here's how it works: Five "classes"—Class D, Class C, Class B, Class A, and Class AA—are set up. All competitors who have no previous classification, or whose ability is unknown, are entered in Class D—the "novice" class. In Class D he will shoot the .22 caliber (or the .38 or .45 at his own option) over the following course: Slow Fire, two strings, five shots each string, one minute per shot, *at twenty-five yards;* Timed Fire, two strings, five shots each, twenty seconds per string, *at fifteen yards;* Rapid Fire, two strings, five shots each, ten seconds per string, *at fifteen yards.*

At these ranges, with reasonable practice, the novice can make good scores. He competes against shooters of ability similar to his own. One medal is offered for each ten entries in each class, or three medals for each class guaranteed. As soon as he places in the prizes in a match, with a score of 270 or better, he is graduated to, and must shoot in, the next higher class—or in the same class with the weapon of the next higher caliber.

In Class C, the courses of fire are the same as in Class D, but the caliber of competition is higher. Here, again, the shooter can make satisfactory scores which will be measured against the scores of other shooters of similar experience and ability; and here, again, as soon as the shooter places first, second, or third in a match, with a score of 270 or better, he is graduated and must shoot in the next higher class or with a gun of heavier caliber.

In Class B, all shooting (Slow, Timed, and Rapid) is done at twenty-five yards. (The Camp Perry Course.) By the time he reaches this classification the shooter will have developed considerably more than tyro ability with his weapon. If he has not already done so, he should now be urged to develop similar ability with a heavier gun—the .38 or the .45. As a beginner with the heavier gun he will be classified one class below his classification with the lighter weapon.

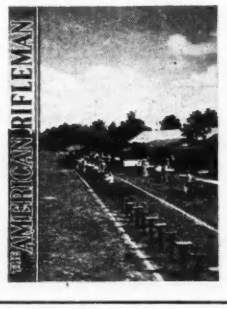
(As a Class B shooter with the .22, he may shoot in Class C with the .38 or .45. This rule holds regardless of the shooter's classification. That is, if a man worked his way up to Class AA with the .22, he could not drop back into the tyro class just because he now wished to shoot the .38. Having advanced so far with any gun, he is far from a tyro and would be "unfair competition" to the real tyros. He must, therefore, shoot the new weapon in Class A—one class below his top classification.)

The shooter who really tries will usually move rather quickly through Classes D and C. He will usually pause a while in Class B. Firing Timed and Rapid from twenty-five instead of fifteen yards makes the course tougher. But he is still shooting against other shooters who have traveled the same course he has traveled, who are encountering the same difficulties he is facing. And here, again, when he places "in the money" in a match, with a score of 270 or above, he moves up into Class A.

Here, for the first time, he shoots fifty-yard Slow Fire in Competition. (Timed and Rapid are still at twenty-five, of course.) He's now "up among the men"—but, please note, he's still shooting against shooters of his own class. The real "hot-shots," the Masters, are in Class AA. Our developing shooter won't have to meet them until he has mastered the fifty-yard, twenty-five-yard course sufficiently well to place "in the money" with a score of 270 or better in registered competition—and when he has done *that* he is ready to shoot in any company.

Proof of the accuracy of this method of classification lies in the following tests: A series of postal matches have been fired, over a period of many months, between Quantico Marine Barracks and the Florida West Coast Pistol League. The turnover in personnel engaged in these matches has been high, especially at Quantico where

(Continued on page 18)



THE COVER

Reversed though it is, to fit the requirements of our cover format, no one who has ever fired the popular National Midwinter Pistol Tournament can fail to recognize our cover picture of the Tampa Police Pistol Club range. This club was one of the first to see the value of up-to-date, attractive facilities; has seen its foresight verified by an unprecedented increase in shooting interest in its area . . . "First Choice," page 37, is the tip-off; "Postwar Planning," pages 16 and 17, is the answer! . . . It's your move!

THE SHORE PATROL

By LT. PAUL SAUNIER, JR., USNR

"CAN THE SHORE PATROL SHOOT? Brother, take a look at the record! Or take a look at that guy there." The burly Navy Shore Patrolman pointed the tip of his night stick at another man wearing an "S" under the eagle of a Navy petty officer's rating badge. "We call him Dick Tracy. He shot a gun out of a man's hand. . . . Sure, I've seen it in print where that ain't possible. But this guy didn't know it wasn't possible, so he did it. It's all in the record. . . ."

They're very proud of their record, these Shore Patrolmen, and with good reason. For the records show that the Navy Shore Patrol, two-year-old fledgling of the service police forces, is as "ready at the guns" as any sea-tried turret gunner.

The particular incident in question, one of many "action" stories in the Shore Patrol files, happened in war-crowded Newport News, Virginia, only a few months ago. A police car with a civilian policeman at the wheel and one of the Fifth Naval District's gray-clad Shore Patrolmen beside him sped toward the scene of a reported disturbance. No servicemen were involved but in Newport News, as in many other maritime war centers, the civil police and the Shore Patrol were working together.

The car slued to a stop before a little crowd of excited Negroes, and the police officer and the Shore Patrolman shouldered their way to the center of the group. An argument among several men had resulted in threats of gunplay, onlookers said, and they pointed to the offender. The policeman moved to arrest the man.

But the Negro, obviously drunk, twisted away. Reeling into the crowd, he reached for a concealed pistol. It flashed in his hand and, at the sharp report of a .38 Special, the crowd surged backward. A man lay moaning on the pavement, shot through the legs. But it was the threatening Negro who was wounded—and the man holding the smoking revolver was the quick-drawing Shore Patrolman. The Negro's gun lay harmlessly on the ground.

One of the companions of the fallen man made a move toward the pistol. The policeman and the Shore Patrolman warned him, but the man in one quick, desperate action made a frantic grab and came up with the gun. A second shot cracked out; a man yelped—and the disputed gun lay, again, on the pavement. The Shore Patrolman had, literally, shot the gun out of a man's hand.

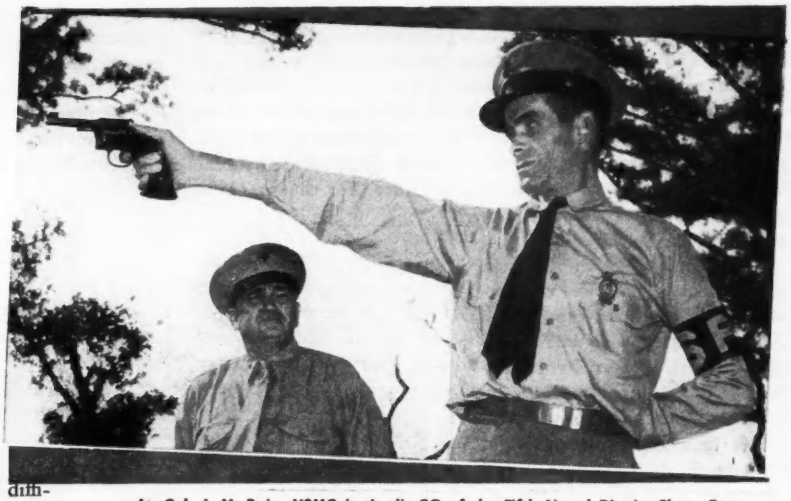
That is just one page from the actual story of the Permanent Shore Patrol. Two years ago, it couldn't have happened. Two years ago, the Shore Patrolman was not the highly trained, coolheaded, armed policeman he is today. He was simply a

Navy petty officer, trained in some field entirely unrelated to police work, who was given a night stick and an "SP" brassard and told to keep his shipmates out of trouble. In the prewar Navy, he was all that was needed. Then, the civil police handled the more serious cases.

That was the Navy, however, before the day when a battleship like the U.S.S. IOWA, docking near some crowded seaport city, could send ashore a thousand seaweary, fun-seeking sailors in one great mass of blue or white. The Navy wants those men to enjoy themselves—they deserve a few hours of fun, if anyone does—but when men from many ships and different bases surge into a seaport on evening liberty they provide "easy meat" for the rackets. Early in the war, the danger of serious trouble loomed large. Railroads began to complain of difficulties aboard coaches jammed with civilians and action-bound or leave-bound sailors. Overworked conductors were unable to discipline offenders. The old Patrol was not enough.

To certain Navy officers and civilian officials who saw the danger in the overtaxing of civic entertainment and transportation facilities, the rising crime, vice, and "racket" rates meant that establishment of a new, specially trained Shore Patrol was an absolute necessity. They knew that sailors are historically more responsive to advice and discipline from Navy men than from civilian officers, and they believed that the best solution lay in an organization of seasoned, coolheaded men in Navy uniform who would assist the civilian authorities in three ways: By giving much-needed advice and guidance to the servicemen (and their families); by investigating "racket" conditions and recommending "clean-up" preventive measures; and by readiness for cool, efficient, police action if a serious occasion demanded it.

What they did with that idea is now important naval history. The original Permanent Shore Patrol was experimentally formed in the fall of 1942, the direct result of an appeal by officials in the jam-packed Norfolk-Newport News area in Virginia. The Fifth Naval District Permanent Shore Patrol,



Lt. Col. J. M. Bain, USMC (retired), CO of the Fifth Naval District Shore Patrol, watches Chief Specialist Millar H. Jones, ex Marine, squeeze the trigger.

Top, opposite page: **Riot tactics are a part of the training program at the Shore Patrol Training School in Norfolk, Virginia. Moving forward step by slow step, this bayonet-barbed wedge will split almost any mob.** ***Above:*** **The ten weapons in which all Shore Patrolmen are trained: the 12 gauge bayonet-tipped riot shotgun; the Browning Automatic Rifle; the '03 Springfield .22; the Reising and Thompson submachine guns; the Hi-Standard and Colt Ace .22 automatics; the Smith & Wesson .38 Special; and the Browning .30 caliber machine gun. (No wonder SP's are tough!)** ***Left:*** **There's plenty of firepower here! Eight Shore Patrolmen center the sights of eight Thompson M1's on the targets at one of the several SP ranges. Sixty-five percent of the graduates of this SP training school have qualified as Experts with this fast-firing, hard-hitting weapon.**

covering important naval centers in Maryland, Virginia, and North Carolina, was initially established with a complement of 300 men and a few officers. Some critical eyes were cast on it at the start, but it tackled its growing job with such immediate success that the Navy, acting on the recommendation of the Congressional Committee which investigated Shore Patrol work, promptly doubled its size. As a direct consequence, patrols built on this model have since been organized for the remainder of the continental United States and for some overseas territory.

They don't all carry firearms; that depends upon local circumstances. In the "hot-spot" Fifth Naval District, the patrol was armed shortly after its formation. "It required an entirely new conception of Shore Patrol duties to arm the men," states Captain E. M. Woodson, USN (Retired), Director of Security of the Fifth Naval District. "But it has proved a wise move in every way." Captain Woodson was one of the officers who worked for the early establishment of the new unit, and it operates under his direction.

From the very beginning, the Navy built the organization around seasoned law enforcement officers. Lieutenant Colonel J. M. Bain, a Marine officer of wide experience, was named Commanding Officer. James F. Ingoldsby, Chief of Police of Roanoke, Virginia, took military leave of absence to accept a commission as Lieutenant (now Lieutenant Commander), and the post Senior Patrol Officer. Ted Miller, a Captain of the Norfolk Police Department and a retired Navy man, donned the blue again to become Lieutenant (jg) Ted Miller, and to become officer-in-charge of the Shore Patrol Training School.

"Bein' a setter used to be fun, when he was here. But doin' nothin' but set for three whole years . . is sorta wearyin'."

Following these officers into the service, in late 1942, there came an eager procession of seasoned, trained, professional law enforcement officers—state troopers, city and county policemen, investigative officers from many fields. Three hundred men temporarily laid aside their civilian uniforms and were fitted with the blue, gray, and white of the Navy Shore Patrol.

Among them were some of the best pistol shots of the Middle Atlantic States. Civilian law enforcement officers have long set outstanding gunnery records; it was natural, therefore, that some of the nation's best small-arms marksmen began adjusting their sights on Navy weapons and firing their records on Navy ranges. Good gunnery in civilian life is good gunnery in the Navy. The records are proving that.

This influx of trained men into the first Shore Patrol gave the new outfit several important advantages in its coming battle with the growing police problem. First, the new group had one of the highest average ages of any branch of service; a factor which would provoke the respect of fun-bent sailors. Second, they had a basic understanding of the technique of police work; and, third, they were men of cool, practiced judgment, much less inclined to take any rash actions in emergencies than are less experienced men. They were fit, if anyone was, to don the Navy uniform and "clean things up."

The first patrol's best-known achievements were, of course, in racket-busting (the Congressional Committee gave them chief credit for the decrease of vice in eastern port cities) and the fruitful policy of "friendly guidance" instead of "roughhouse" methods, which resulted in a drop of the maximum nightly arrest rate from over 400 to less than fifty. Most of their success was due to their knowledge of men, but some of it came from their knowledge of guns. Shore Patrol officers believe that the Shore Patrolmen's training in the use of small arms has saved lives, health, and property beyond all consideration of cost.

The first step in Shore Patrol gunnery training begins almost the hour the man "breaks out" the "S" rating badge on his new uniform. Before he's looked into the mirror twice to see if his red stripe shows up well enough (all Shore Patrolmen have at least the rank of a third-class petty officer, equivalent to that of an Army sergeant), he's out on a modern Navy range learning the know-how of the Smith & Wesson .38 Special, the "old faithful" revolver of most police services. The chances are that he's already qualified with the weapon during his civilian experience but the Navy takes no chances. Chief Petty Officer Millard H. Jones, Gunnery Instructor at the Shore Patrol Training School at Norfolk, is proud of the perfect safety record he has made in training the hundreds of sturdy Shore Patrolmen who have fired under his watchful eye, and he's determined to keep it. In all the history of Shore Patrol training here, there has never been an accidental discharge of any weapon. When the new Shore Patrolmen are issued their first Navy-owned revolver, the .38, that record is drilled into them with force.

Chief Jones, incidentally, is typical of the men around whom the new Shore Patrol was built. He wasn't always in Navy blue; for ten years he wore the green of the United States Marine Corps, where proficiency in arms is not only a goal, but a fact. In 1939, he exchanged his buck sergeant's stripes for the position of Chief of the Protective Force at the Federal Reserve Bank in Richmond, Virginia, where he was serving when the Navy gave him his present rate. As a civilian, Jones was very active in Richmond shooting circles, for some years ranking Number Two pistol shot in the city.

Chief Jones believes in dry firing to such an extent that, even after familiarization and stripping studies are completed, his students dry fire each course at least twenty times for every one time they burn powder. "It's the only way," he says. "It puts the emphasis on aiming instead of firing. Anybody

can make a cartridge explode, but it does no good unless the aim and squeeze are right."

Once a budding Shore Patrolman has qualified with the .38, he goes on his first patrol duty, paired with an experienced man. Together the two patrol the busy seaport cities on foot, or perhaps they cruise a wide area in one of the Patrol's modern, radio-directed prowl cars or ambulances in which they can answer calls for assistance in minutes, or even seconds. Or they may be in a radio-directed motorcycle squad; or perhaps they'll be stationed in railroad stations to assist traveling Navy personnel (by agreement with the Army, they have control over soldiers as well as sailors). They may ride the trains to check leave papers, to make certain no "bad penny" servicemen are trying to leave their stations without permission. They may stand guard near business establishments or residential districts declared "out-of-bounds" to servicemen because of reasons of sanitation or for other causes. Whatever they are called on to do, the new Shore Patrolman will see his more experienced partner giving friendly but firm advice to erring sailors, giving helpful assistance to questioning travelers and, when necessary, demonstrating what he can do with a nightstick or revolver. If serious riot trouble breaks out, he'll see what the SP's can do when the Thompson submachine guns, the bayonet-tipped riot guns, gas shells, and grenades are "broken out" for emergencies.

Lieutenant Colonel Bain, incidentally, is particularly proud of the fact that, in the majority of cases where Shore Patrol guns were involved, the SP's *readiness* with the gun, in "getting the drop" on offenders, prevented the necessity of actual firing.

At the Shore Patrol Training School at Norfolk, to which men report for advanced work after their initial period of Shore Patrol duty, more hours of study and practice are spent on the subject of small arms than on any other. No Shore Patrolman in the Fifth Naval District can be promoted until he has finished this intensive course which includes, in addition to many naval subjects, Law of Arrests, Technique of Arrests, Court Procedures, Self-Defense (judo), Traffic Control, First Aid, Lifesaving, and Bayonet and Riot Drill.

The small-arms course, taught by Chief Jones, covers ten weapons: The 12 gauge riot gun, with bayonet; the .30 caliber Browning Automatic Rifle (the famous BAR); a standard Springfield .22 caliber target rifle; the Reising submachine gun; the Browning .30 caliber ground machine gun; the Thompson M1 submachine gun; the one-and-one-half-inch tear gas gun; the Hi-Standard and the Colt Ace. The candidates do more work, too, with the S.&W. .38 Special.

Although the SP's learn the field stripping and firing of all these weapons from A to Z, the emphasis is naturally upon the weapons they expect to use most—the Thompson and the .38. Firing is done on three ranges, one of which is a 500-yard outdoor range near Virginia's famous Dismal Swamp, where the chatter of the guns and the blast of bursting gas grenades won't disturb any nearby residents. A well-lighted, modern indoor pistol range is located at the training school for practice.

Chief Jones is particularly proud of the record made by the Shore Patrolmen handling the Thompson M1; and rightly so because 65 per cent of the men under his instruction have qualified as Experts, 24 per cent as Sharpshooters. He considers the .38 caliber record of 20 per cent Experts and 24 per cent Sharpshooters, as about normal. The courses on all the guns are standard, essentially the same as those given our hard-hitting Marine and Army troops, although the Shore Patrol's duties do not ordinarily take them into the battle areas.

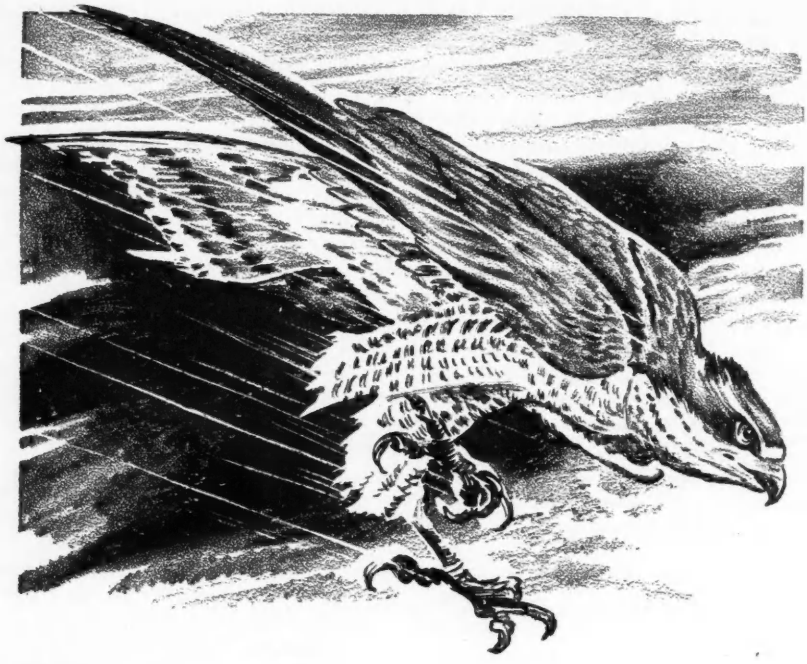
To be sure that the Shore Patrolmen won't be completely landlocked, however, a few volunteers are sent on two-month cruises aboard Navy warships, so that they may better understand the men with whom they deal in their shore duties. The quota incidentally, has been filled in short order every time.

Chief Petty Officer M. J. Yankovich, former Army Air Forces armorer who was with the Richmond Police Department at the time he received his gray Shore Patrol uniform, is in charge of the Shore Patrol Armory at Norfolk, and is assisted by Specialist First Class (S) Morris C. Yoak, a former West Virginia State Trooper. Yoak, who does most of the repair work on the Shore Patrol guns, won all three stages of the Sharpshooter Class, revolver and pistol, in the NRA matches at Richwood, West Virginia, in 1940, and was high man in both .38 and .22 pistol firing in a Virginia State open match in 1943. Yoak and three other former policemen, firing as a Shore Patrol team, also took team honors in the latter match.

The Shore Patrol believes in plenty of good, tough physical training, too. Another ex-Marine, Specialist First Class (S) W. C. Buckner, is a judo expert who makes the SP's joints creak with his rough-and-ready tactics. When a man has learned gunnery from Chief Jones and judo from Buckner, he can handle almost any type of attack quickly and surely.

One incident in particular shows the result of Shore Patrol training. A very dangerous character, a sailor wanted for the murder of two policemen, was recognized on a city street by a squad of Shore Patrolmen cruising in a Navy vehicle. To prevent alarming the man, the Shore Patrolmen continued on, but shortly dropped two men to follow him while they drove around the block to head him off from the other direction. The man entered a drugstore, where a civil policeman was being served at the counter. As the man stopped in the center of the store, the two SP's seized him from behind and pinned his arms so he could not reach for his own weapon. The civil policeman recognized the man in the mirror, turned, and drew his own gun in such excitement that he dropped it on the floor in front of the culprit, who promptly picked it up. Quick action by the SP's changed his mind about that, however; and, by the time the SP car had circled the block, the two SP's, the sailor, his wife, and the civil policeman were waiting. It was all in the day's work.

The Shore Patrol may not seem as glamorous as the Army MP's, since they do not serve in battle areas. But in saving the morale, health, and even the lives of war-weary sailors on the streets of America's teeming cities, they do a medal-winning job. ● ● ●



The BOMB SHOT

MY BROTHER, IKE, was never quite satisfied with his .22 Hornet. She had plenty of muzzle velocity, but the trajectory was not flat enough to suit him. Also, she lacked the shocking punch which knocks down game and keeps it down. He wanted greater point-blank range and the increased shocking power of a larger bullet. He got this by having his Hornet converted into a Lovell. . . .

Ike is now living with a sniping rifle somewhere on the Western front. But here is a story about him and his Lovell that shows what Germany is up against in the way of Yankee marksmanship and Yankee ingenuity.

One Sunday afternoon late in June, a neighbor of ours drove up to the barn where Dad, Ike, and I were making preparations for haying. "It's a darn shame," says he, neighbor-fashion, "that somethin' can't be done about them hawks."

Dad straightened up from his riveting on the new pitman rod. "Hawks? What hawks?"

"I've just been over to Mount Hunger. Old Mrs. Matthews has lost two hatchin's of chickens already, and she's plum discouraged about startin' off a third batch. There's a nest of hawks up back o' her. Nobody's ever been able to clean 'em out. Course, if I was young and had a good shootin' eye. . . ."

Good or not, that eye drilled straight at me as that remark was made—and then at Ike. Ike looked at me, and I looked at him . . . and the die was cast. We all knew Mrs. Matthews. We all knew, too, how badly she needed good luck with her chickens. We also knew the exact crag where the hawk aerie was located. I had wing-shot a hawk there once, long ago, with a little Stevens .22. Since that day the birds had been as wary as a squad of Marine-hunted Japs. You couldn't get near 'em; or, if you did, there was always some granite minaret in the line of fire. There was no way to shoot down into the nesting place either. It was on the tip top of a rock column on the back flank of Mount Hunger; a precipitous monolith with no higher spot anywhere near it.

Later that same afternoon, Ike and I reconnoitered the rugged wilderness back of Mrs. Matthews' solitary homestead. We saw what we could see and on the way down the mountain we rapped at her door. Ike said, "We just stopped in, Mrs. Matthews, to tell you it'll be all right for you to go ahead with your next settings of eggs. Brad and I are fixin' to clean out those hawks."

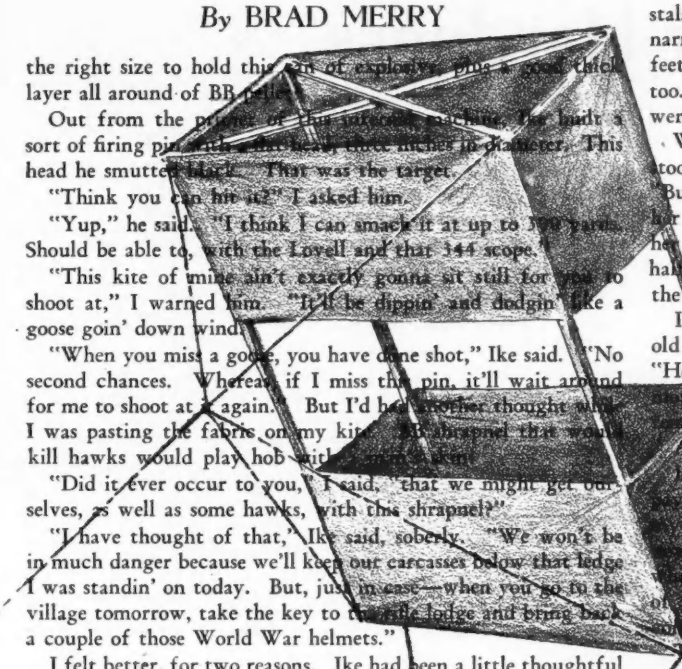
The old lady was grateful but she had her doubts. "That's mighty nice of you," she said. "But you're apt to kill yourselves up there, if you ain't careful. You wouldn't be the fust ones. Varney Soames' boy tried to climb that finger . . ."

We grinned at her. "Don't you worry," we told her. "We aren't going to climb. We've got a plan; somethin' nobody else ever tried. It'll take us a day or two to get ready, but some day when there's a brisk wind from the south we'll come out this way again. And when we do—well, there'll be no more hawks! Your new chickens 'll be safe, time they're big enough to get out in the yard."

Back home that evening, by the light of a gasoline pressure lantern, I set to work sawing, out of dry pine, the spars and braces for a great six-foot box kite. . . . At the other end of the workshop, Ike busied himself with a far different contraption. Ike proceeded as follows:

Into a screw-top tin which had once held furniture polish, Ike poured about a full pint of black powder. Into the center of this he tamped, very gently, a quarter of a stick of dynamite. (Dad got the black powder after old Joe Paine went through the ice and got drowned. Joe's widow gave Dad Joe's old Civil War muzzle-loader and some green cans full of powder and shot. Joe wasn't apt to need 'em, she figured, and Dad might.) For a detonator, Ike used a 16 gauge shotgun shell, minus the shot. But there was shot in our bomb—and plenty of it! An ice cream carton was just

By BRAD MERRY



the right size to hold this [illegible] explosive, plus a good thick layer all around of BB pellets.

Out from the [illegible] machine. He had a sort of firing pin [illegible] three inches in diameter. This head he smutted black. That was the target.

"Think you can hit it?" I asked him.

"Yup," he said. "I think I can smack it at up to 300 yards. Should be able to, with the Lovell and that 344 scope."

"This kite of mine ain't exactly gonna sit still for you to shoot at," I warned him. "It'll be dippin' and dodgin' like a goose goin' down wind."

"When you miss a goose, you have done shot," Ike said. "No second chances. Whereas, if I miss this pin, it'll wait around for me to shoot at it again." But I'd had another thought while I was pasting the fabric on my kite. Shrapnel that would kill hawks would play hob with [illegible]

"Did it ever occur to you," I said, "that we might get ourselves, as well as some hawks, with this shrapnel?"

"I have thought of that," Ike said, soberly. "We won't be in much danger because we'll keep our carcasses below that ledge I was standin' on today. But, just in case—when you go to the village tomorrow, take the key to the [illegible] ledge and bring back a couple of those World War helmets."

I felt better, for two reasons. Ike had been a little thoughtful about that bomb, too!

We flew our big kite in various winds, with and without the load-equivalent of our "machine." By trial and error, I experimented with aerodynamics until my kite carried Ike's bomb easily in a twenty-five-mile wind. It worked but that great kite was as tiring on the arms as the [illegible] of a spirited, yearling colt! . . . Meanwhile, Ike practiced [illegible] with the Lovell until he was used to the kite's maneuvers. He didn't shoot, for he has a particular aversion to [illegible] into the air—to fall to earth the Lord knows where. In spite of the evidence of the kite bomb to the contrary, Ike wasn't reckless. He just sort of believes in doing what has to be done.

Before a fortnight had passed we got our day. The wind breezed up strong from the south, and Dad spoke to us as we came down from the unloading of our second rack of hay:

"This wind means rain, tomorrow or next day, I reckon. I shouldn't let you go, but—we'll plan to get in the rest of the hay this evenin'. Don't forget to duck! . . ."

We barely heard that last warning. We were already on our way to the shed where our kite and its burden were waiting.

We must have looked like a couple of scouts for some guerrilla band, as we came up that wood road on the mountain. We both wore helmets, Ike's was German and mine was of U. S. issue, both World War I. Ike climbed ahead of me with his scope-sighted Lovell, the bomb bulging out the back of his old blood-stained hunting coat. I carried the kite, rolled up like a camp cot, with a coil of new cod line over my shoulder.

The hawks were awing as we neared their aerie. From time to time, we caught glimpses of them through the moving fronds above us. In spite of the wind, the sun shone and the climb warmed us as much as had our work in the hay. Or perhaps it was excitement that beaded our brows and made our shirts stick to our shoulders.

We assembled the kite on a shelf-like ledge some 130 yards south of the formidable, eighty-foot monolith which reared its stalagmite shape above us. The hawks—four of them—had narrowed their circling and dropped down to some 700 or 800 feet of elevation. There were young ones up there on the crag, too. We had heard them that other day, and now their outcries were stronger and more savage.

We were excited, all right. Ike and I both admitted it as we stood holding our kite away from the lifting angle of the wind. "But we got to steady down," Ike said sternly. "Don't let her go yet; and when we do let her go, for Pete's sake don't let her get into a dive! With that bomb on her, she'd blow down half o' the mountain! . . . Hold her now, while I get down on the ledge and get set."

I held her, and waited. While I waited, stray words out of an old song came into my mind. How did it go? Something about "He was bleedin' like a fountain when they found him on the [illegible]." I shook my head. That was a hell of a song to remember at that moment! . . .

[illegible] then Ike said, from below me, "Let her go!"

I let her go. The wind held steady and the kite lifted. I [illegible] line. The kite dipped and I steadied her—and felt [illegible]. The hawks still circled above us, excited, too, [illegible] apparition rising slowly toward them. I wondered [illegible] happen if one of them should dive at it. One brush of [illegible] wings and the kite would dive, too! I could never [illegible] it. . . .

The kite was a hundred feet up now, and not far from the aerie. I started to back toward the ledge we had chosen as our firing platform. I looked back over my shoulder, and—Ike was aiming! I cast one frantic glance upward. A hawk was diving—wings flanged back, claws out—straight at the kite. Behind me, Ike's Lovell spat viciously and, brushing the kite cord as he passed it, the hawk fell. He struck hard on the talus just above us and rolled down past us—and I wondered why we had bothered building a bomb when Ike could shoot like that! I saw that hawk later and he was shot straight through the breast!

But Ike was already aiming again. He barked at me, "Come on! Get down here!" I got! Yanking at my line, I hit the ledge. The Lovell barked again. This time Ike said, "Nuts!" and pumped the bolt. He'd missed. There was a hole in the kite, but he hadn't hit the black bull's-eye that would drive the firing pin into our "primer."

Two hawks remained aloft, while their progeny screamed and squalled around the nests. One of the remaining parent birds came swooping in, power diving, and went out of sight somewhere above us. The other bird remained on high patrol. Brown and gray feathers littered the rocks—floating in the wind.

Ike put two more shells in his clip. I paid out line and we waited until a slack in the wind let our kite down to a [illegible] forty feet above the rock. "Better shoot," I said, "before she drops lower and founders!"

While Ike was getting his scope right [illegible] the last hawk decided it was time for a blitz. He swooped in, urged on by the screams of his spouse and other relations.

Ike told me later that he didn't really plan the timing of that shot. But it was perfect! The bullet rammed the pin right in the face of the diving bird. There was one hell of an explosion! My line went limp, and things began to whirl through the air and off the rocks around us . . . Our booby trap worked! . . . Later, when we looked up, there was not even any smoke. But there were no hawks, either! Our shrapnel blast had done its work. There were no more sounds of life from the aerie.

Mrs. Matthews' hawk troubles were ended. ♦ ♦ ♦

Measuring Bullet Hardness

By COLONEL E. H. HARRISON

ONE OF THE MOST IMPORTANT PROPERTIES of a bullet is its degree of hardness. In the case of cast bullets, it is the property most under the control of the experimenter, once the mold has been selected. It is, therefore, somewhat surprising that means of measuring hardness are not more generally used by makers and loaders of cast bullets.

This may be due, at least partly, to the general lack of a suitable measuring method within the financial means of those interested in cast bullets. However, some ways have been devised to make such measurements by means rapidly available, and this article describes a method that has proved successful.

When the concept of hardness is examined thoroughly, it is found that it is not completely simple. But a very serviceable definition is that "hardness is the ability to resist damage." Since damage may take place in a number of ways, it is not surprising that hardness may be measured by more than one method. The most generally useful procedures are based on measuring the indentation produced in the material by the tip of a tool applied with a specified force. Any sample of reasonable size and thickness may be used, and the piece is not damaged except for the small indentation mark of the tool. With these advantages, it is easy to see why methods of this type are standard for hardness measurement. The most common are the Brinell and the Rockwell.

In the Brinell method, a 10 mm. ball of very hard steel is pressed into the surface of the tested material by a load of 3000 kilograms, or 500 kilograms in the case of soft material. The diameter of the resulting impression is measured with a low-power microscope, and compared with a table to get the Brinell hardness number. This test is used and understood all over the world.

The Rockwell tester, popular in the United States, is generally similar except that the indenting tool is conical and depth of penetration is the measurement used. A kindred method used in England employs a pyramidal point and is known as the Vickers. (The Scleroscope, which measures surface hardness by the height to which a small weight will rebound when dropped on the piece, is of no interest here because it is obviously unsuited for use on such soft materials as lead alloys.)

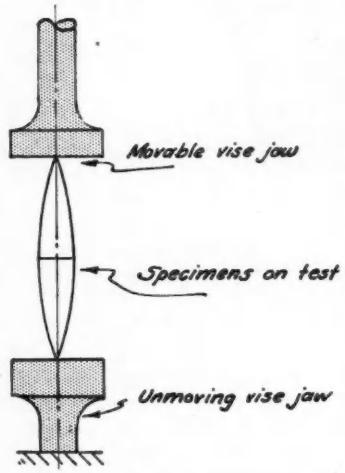


Figure 2. Vice test compares a known hardness with an unknown.

The cost of the above machines places them far out of reach of the average handloader. The Potter bullet-metal tester is produced to fill the need of the dyed-in-the-wool experimenter, and sells at a price comparable with that of other loading tools. In operation, the machine subjects a sample of the bullet metal to the pressure of a small steel ball. This pressure is applied by a leverage system such that a considerable movement of the outer lever arm is produced by a small movement of the ball. The end of the outer arm moves over a graduated scale and carries a hook. A prescribed weight is hung on the hook, and the scale indication is read when the weight has nearly stopped descending or at the end of a specified time. The time factor comes strongly into play because of the plasticity of lead alloys. Because of that, one cannot expect to get as precise a measure of hardness in bullet alloys as in materials such as hardened steel which have but little cold flow. The similarity of these operating principles to those of the Brinell and Rockwell is plain, and the Potter machine performs its functions very well.

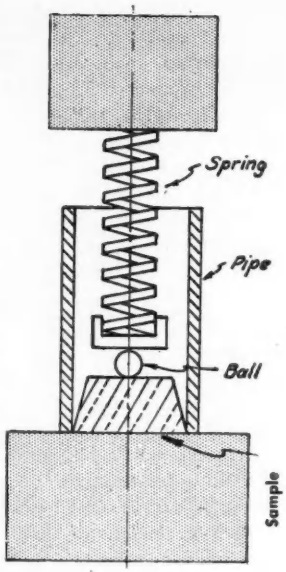


Figure 1. Steel ball is pressed on sample alloy under uniform pressure.

My friend Major F. W. Whitlock, who is a genuine expert in the making of measurements by modern electrical methods, has at times experimented with hardness measurement using only those means already available to the average handloader. One such method is given in Figure 1. This shows in longitudinal section the pressing of a steel ball into the alloy sample by an arrangement which insures the application of the same pressure every time. The special apparatus consists of a short piece of iron pipe with the ends squared, and a stiff coil spring such as an automobile valve spring. The regular valve spring washer serves to center the ball in the end of the spring. The assembly is placed within the jaws of a vise as shown in the figure, and the vise closed solid on the ends of the pipe. The pipe acts simply as a spacer to insure the same amount of compression of the spring each time (disregarding small differences in the amount the ball penetrates different samples), and therefore the application of the same pressure. The diameter of the impression is a measure of its hardness, as with the Brinell system.

It is evident that measurements thus obtained will vary with the diameter of the ball, the stiffness of the spring, and the length of pipe used. However, if desired the ball diameter could be standardized and the pipe cut to such a length that pressure would be any predetermined amount. A dead-weight calibration would establish this. The diameter of the impression is measured with an ordinary micrometer caliper, which is in the possession of most reloaders. With the help of a magnifying glass, this measurement can be made quite accurately without much difficulty.

The simplicity of this method and the fact that it is essentially the same as the Brinell method make it quite attractive to me. Major Whitlock does not like it, however, because of what he considers the finickiness of the operation of measuring

the impression. He prefers the following, which so far as I know is entirely original with him:

The setup is shown in Figure 2. Two bullets, one cast of the metal to be tested and the other cast in the same mold of some metal taken as the standard, are required. They are placed base to base within the jaws of a vise in the position shown. The vise then is tightened until the points of the bullets are crushed somewhat. The exact amount of the crushing is not important; it can be gauged visually or controlled by a small metal stop. The length of each bullet then is measured in order to determine how much each has been deformed. The ratio of the two losses in length is taken to be the hardness of the unknown alloy with respect to the standard.

For example, suppose that the bullet employed is the Squibb gas check, Ideal No. 311413, measuring 1.035 inches long as cast. This length can be measured with the ordinary one-inch micrometer caliper. Some bullets are cast of pure lead for use as standards. This standard can be reproduced easily, and gives every experimenter a common basis for comparing his results with those of anyone else.

One of the pure lead bullets and one of the unknown alloy are compressed together as described. Then the test bullet is found to be 1.008 inches long, while the standard one is .996 inch. By subtracting these figures from the original length, it is found that the two bullets were shortened .027 and .039 inch respectively. The value of the fraction .039/.027 is found by division to be 1.44. This is the hardness number of the tested alloy determined by the Whitlock Method.

There are some interesting points about this determination. First, it may be wondered why the lengths of the two compressed bullets just as measured were not taken to form the ratio. The hardness number found by that procedure would have been 1.008/.996, or 1.012. One objection to this is that hardness numbers so computed would be always quite close to unity, whereas we all know that the range of hardness of lead alloys is considerable. But the fundamental objection is that the hardness number obtained would be partly dependent on the length of the particular design of bullet used to make the test. When the ratio of the *amount of crushing* is taken, however, the hardness number obtained is independent of the style of bullet chosen, as it should be.

The second item of interest is that the deformation of each bullet is inversely as its hardness. Therefore, the change in length of the standard is placed in the numerator and that of the tested bullet in the denominator of the fraction which forms the hardness number. Algebraically,

$$(a - x) \div (a - y) = H$$

where a = length as cast
x = length of standard bullet after compression
y = length of tested bullet after compression

In the example given, the standard pure lead bullet was compressed .039 inch and the alloy bullet .027 inch. The ratio of these two numbers taken in the order stated is 1.44. In this way a metal harder than the standard is always represented by a value greater than unity and one softer than standard by less than unity. This is as it should be.

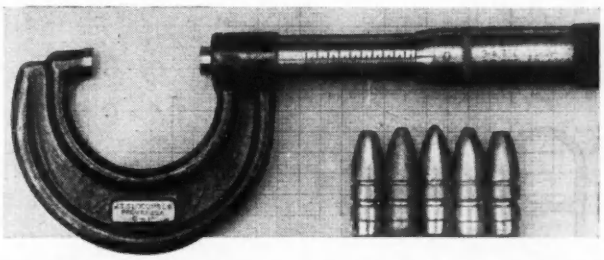
It was mentioned that the amount the vise is closed on the bullets is not important so long as the crushing is not unreasonably great. The experimenter will wish to try several samples at each test, and take the mean. He will find that results from bullet to bullet will not differ sufficiently to impair the usefulness of the test. For example, the following was obtained from four Squibb bullets:

Original Length	Crushed Length Std.	Crushed Length Test	Deformation Std.	Deformation Test	Hardness Number
1.037	.978	1.007	.059	.030	1.97
"	.972	1.008	.065	.031	2.10
"	.973	1.010	.064	.027	2.36
"	.974	1.007	.063	.030	2.10

The first of the four bullets tabulated above was dropped into cold water from the mold. This brings out another reason for hardness measurements of cast bullet metal sometimes coming out differently than expected—the hardness of a lead alloy depends on its rate of cooling and also on its age since the last melt. The first of these factors is not important in cast bullets, but the latter is material in very careful investigations. The only thing that can be said of this is that the experimenter can determine the magnitude of the effect for himself very easily, and allow for it if he finds it desirable.

The striking thing about this method of hardness measurement is that the equipment it requires is composed of only the bullet mold, a small vise, and a micrometer caliper. The first is not extra equipment in any sense, since the reloader must have it if he is going to make any cast bullets in the first place. The other two items are already in the hands of the majority of cast-bullet makers or experimenters.

There is one limitation in the application of the method, namely, that it cannot be used with bullets having more than a very small flat on the nose. The reason for this is found in the mechanism of the test. When pressure is applied to the two bullets, the point of the softer one first begins to give way simply because it is the softer. When this occurs, a greater cross-sectional area of the softer bullet's point takes the force; and as this is continued, the pressure on the point of the harder bullet becomes sufficient to deform it also. Thus the deformation of each bullet varies inversely as its hardness, in some proportion. But in the case of wadcutter bullets, to illustrate by an extreme example, there is little increase in the pressure area as the end of the bullet is compressed. The result is that the softer bullet simply continues to crush as the load is increased, and the harder one has little or no occasion to crush. Consequently, this method of measurement works properly and reliably only with round-nosed or pointed bullets.



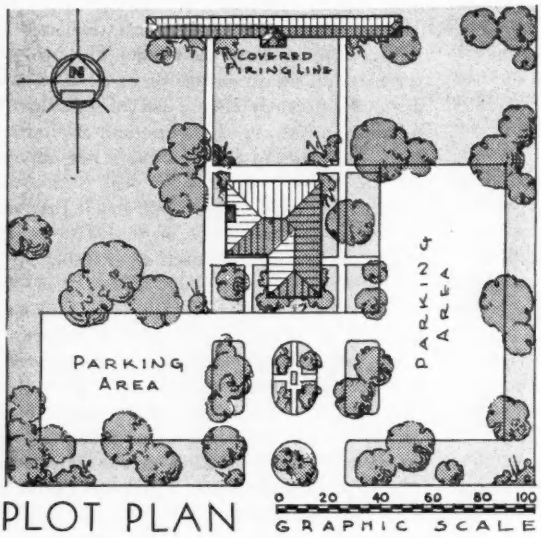
A micrometer caliper measures results of vise test shown in Figure 2. Bullet No. 1: Pure lead element after test with No. 2. Bullet No. 2: 1:20 tin-lead alloy compressed as result of test. Bullet No. 3: Uncompressed element. Bullet No. 4: 1:10 tin-lead alloy after testing. Bullet No. 5: Pure lead element after compression test with Bullet No. 4.

The reloader will see at once that the most usual application of bullet-hardness measurement will be in the duplication of a batch of metal which gave the results he liked. In this way, and in this way only, can the varied and unknown scrap which most of us gather be used to make good bullets. ● ● ●

POST WAR

The Basic Requirements

25 TO 50 TARGETS



PLOT PLAN

Last month we indicated with thumb-nail sketches some ideas for post-war "face-lifting" operations on rifle and pistol ranges.

Here is the first detailed plan for an inexpensive, attractive, efficient outdoor range clubhouse and office.

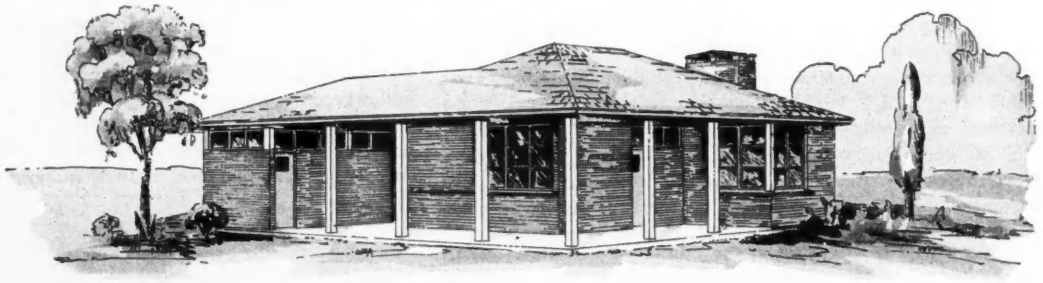
A building of this size is within the reach of every small club; it is not just another pipe dream. Interested club officials can, by writing the Association, obtain free of charge, complete blue prints and outline specifications for the construction of this clubhouse, including plans for the construction of the folding furniture. Individuals who are interested in the plans may obtain them by sending $1.00 to National Headquarters. Ask for Outdoor Range Plans No. 1.

The building shown is a simplified "ranch house" type which will fit nicely into the landscape in almost any section of America. Suggestions for Colonial and Spanish styles are shown on the small elevation sketches. The plan can also be executed using peeled logs, field stone, clapboard siding, or any other treatment which seems suitable to your local architect.

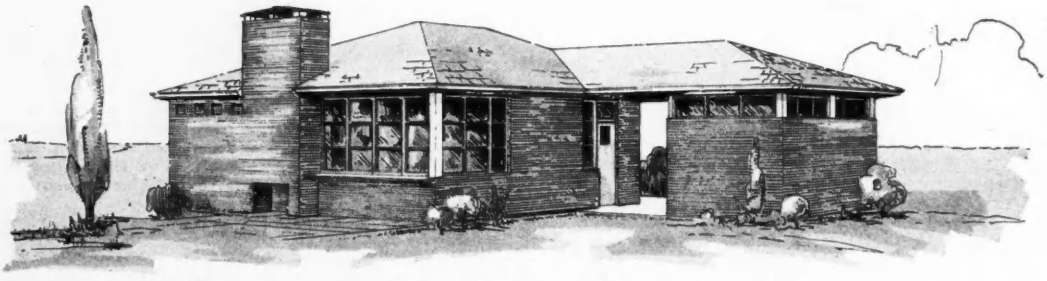
It is not expected that this design will fit the needs of every club. Other plans will follow. This plan, however, provides a building which—

1. Gives space for small social gatherings and regular club meetings.

(Continued on page 31)



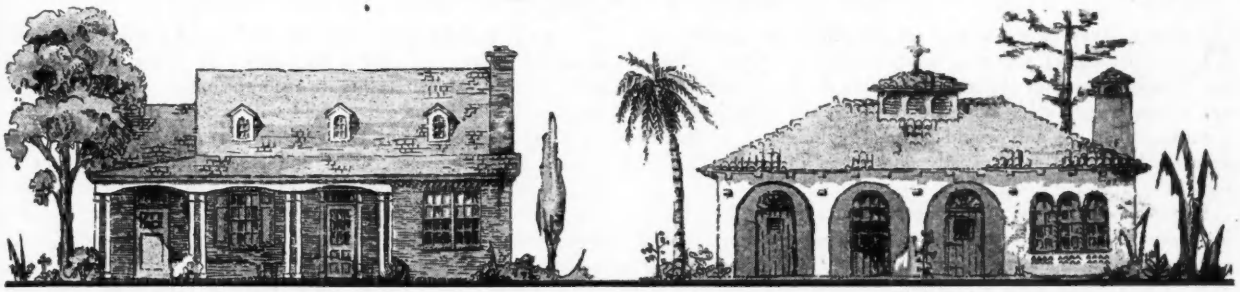
Perspective from Northeast



Perspective from Southwest

NRA Planning

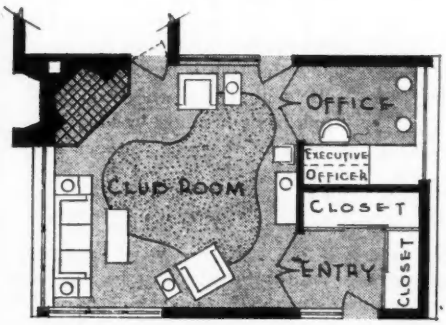
for an Outdoor Range House



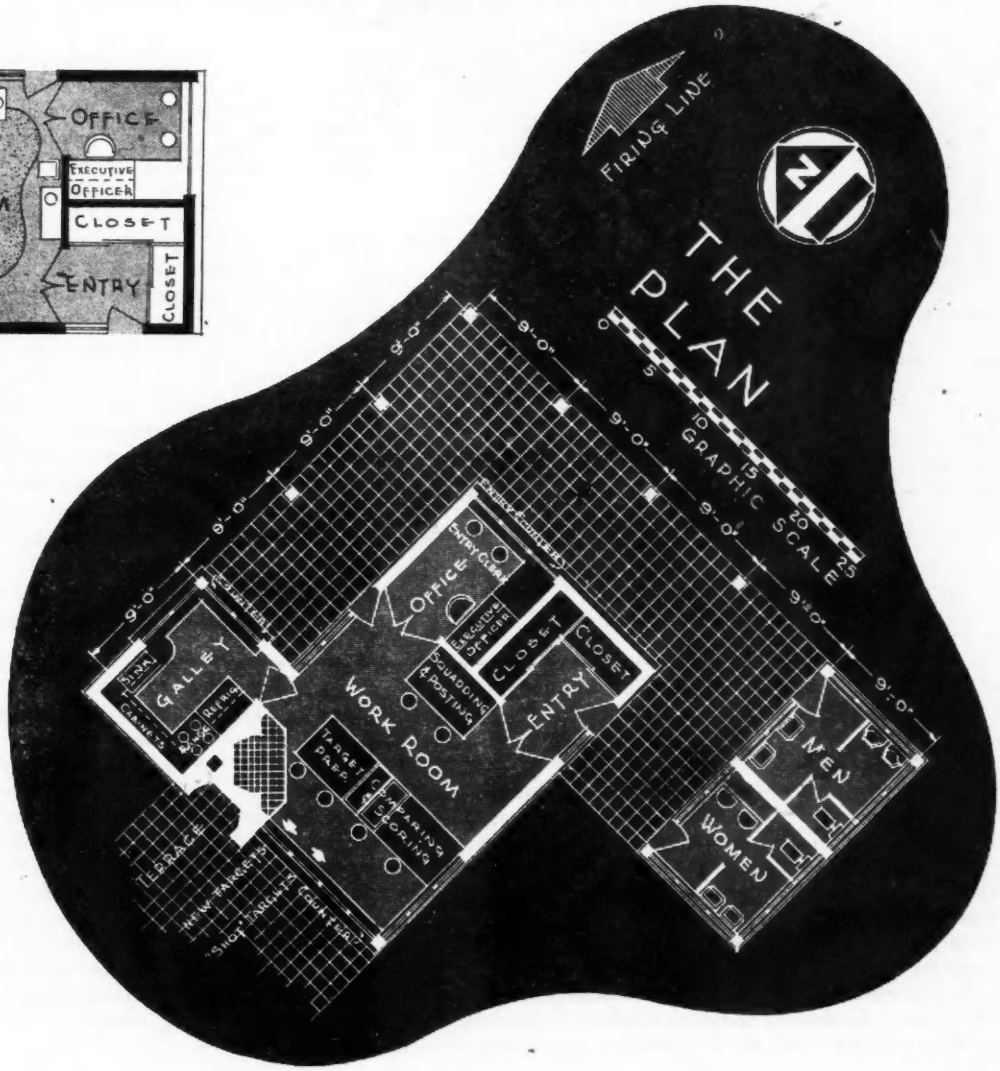
North Elevation
In a Colonial Style

North Elevation
In a Spanish Style

The above sketches show two of the many possibilities of architectural style and material using basically the same plan.



The above plan indicates the adaptability of the layout: how the workroom is converted into a clubroom when matches are not being run. All of the office furniture is designed to fold compactly in order to be stored in the entry closets when not in use. Likewise, the clubroom furniture is to be stored in these same closets during registered tournaments.



"Instinctive" Shooting

By WALTER F. ROPER

A LITTLE OVER A YEAR AGO, in an effort to simplify the development of accurate, short-range, "instinctive" shooting (shooting without the use of the sights), the writer worked out a simple half stock designed to force the hand into such a position that the gun would point straight ahead, instead of slanting downward as it usually does when the arm is shoved forcefully forward toward the target.

It was hoped that use of this simple device during early training would help new shooters learn the hand position required so that, in a much shorter time, they would be able properly to point a gun fitted with regulation stocks for instinctive shooting.

Tests of the stock by several friends, and finally by a large number of officers at one of the great camps, proved conclusively that any shooter could do surprisingly good work with a gun so equipped up to twenty-five yards simply by shoving the hand toward the target and firing without any sighting whatever. Groups measuring six to eight inches in diameter were not out of the ordinary. Best of all, it was found that men unfamiliar with handguns were able to do very good shooting after only a few minutes practice.

A Colt .45 auto with wrist-lock stock which cures the normal tendency of the gun to point low when thrust at a target in combat shooting.

The stock was, of course, not permissible in regulation target shooting, nor was it intended for use in Slow Fire shooting; but the scores made, particularly by novices, at fifty yards Slow Fire were clear proof that control of the movements in the wrist joint is a most important item in the target, as well as in the combat variety of handgun shooting. Anything designed to prevent movement in the wrist joint is expressly forbidden in target shooting. The prohibition is made obviously because any such appliance would be a mechanical means of producing greater accuracy.

And so it is, as any shooter can prove for himself. For instinctive or any other kind of shooting, a stock of this type, or any device which locks the wrist joint, will greatly increase accuracy. It's like using a sling on a rifle.

This ties in very aptly with the methods of combat shooting described in the July, 1944, RIFLEMAN by Major Rex Applegate. Briefly, Major Applegate recommended: (1) A "ready" position in which the gun is held with a very tight grip, with the arm extended to the front at an angle of about forty-five degrees to the ground, wrist and elbow joints both locked; (2) Swing arm (and gun) upward from the shoulder until the gun is in a line from the eyes to the target, and fire the instant this position is reached, without any attention to the sights. For shots at targets not directly in front of the shooter, the whole body is turned so that the shooter faces the target. Firing is done in fast two-shot bursts.

The results possible with this method are remarkable and the method is easily learned. It should be of great interest to all police officers who may have to use their guns under conditions in which aimed shooting is impossible.

It will be noted that Major Applegate's method produces the same condition—i.e., proper angle of hand to the forearm and, hence, level pointing of the gun—that made the wrist-lock stocks successful. With the stock, a definite predetermined position of the hand is assured by a stop which contacts the underside of the forearm just back of the wrist joint. Major Applegate's method produces similar results by having the shooter assume a "ready" position which does away with the forward motion in bringing the gun to the firing position. Since it is the forward thrust which, combined with a tight grip, results in the common tendency to point low, this method works. With either method, the elimination of movement in the wrist is what permits the fine results obtained.

It is, of course, too early to guess at what the handgun game will be like when matches are possible again; but would it not be possible to include in our shooting programs a safe match designed for those shooters to whom "instinctive" combat shooting is most interesting and of great practical value? ◆ ◆ ◆

Pistol Classification

(*Continued from page 7*)

a constant flow of trainees results in an ever-changing roster. For the purposes of this comparison, the scores of the five high competitors in each of the five classes were totaled for each "team." This involves a total of twenty-five shooters on each side, each man firing once through the course, thirty shots per man, Slow, Timed, and Rapid, for a total possible of 7500 per side. In each match, *less than one hundred points separated the winning and losing teams!*

But the most important result of such classification is its popularity with the shooters themselves, and the successful growth of clubs using this method. New shooters enter competition at a level and under conditions enabling them to make gratifying scores—even to win prizes. They're as proud of those prizes as the Master is of his; and justly so. They are not subjected to the embarrassment of seeing published beside their names scores fifty, sixty, even a hundred points below the scores that won the medals. That this helps hold shooters in the pistol game is proved beyond question by the record of the Florida West Coast League. Nowhere else has pistol competition grown more rapidly, to include a wider, more loyal membership in pistol clubs. Shooters who take up the game under this system go on shooting, become better shooters, and bring their friends in after them.

The system has had a thorough testing, in civilian clubs and under military training conditions. It works! Why not make it general? ◆ ◆ ◆

PRECISION POWDER MEASURE

By GEORGE N. VITT

HANDLOADING HAS, IT SEEMS TO ME, an importance far beyond the mere economy it provides. It helps us to become *intelligent* shooters, whatever firearm we may use. It may interest you to know that loading rifle and revolver cartridges by private citizens is practically unknown in any country but our own. In the past, at least, only shotgun cartridges were loaded by shooters even in such game-abounding areas as Siberia, North China, and others where I had opportunity to hunt and become acquainted with local practice.

However, my own interest in handloading got an early start. When I was ten years old I lived in a town named Habarovsk, in Eastern Siberia. My father, one of the few high government officials in Eastern Siberia, had an aversion to guns and hunting; so much so that he would not eat game. He also had character and ruled the household with an iron hand. Here was a constant source of clashes, for I was a devotee of shooting, fishing, and camping. Luckily for me, an uncle of mine also lived in Habarovsk, and he was a sportsman, owner of a number of shotguns and rifles, three setter dogs, a two-lung motorboat (then a luxury in that remote region), and powder and shot by the keg. Naturally, he did his own loading of shotgun cartridges; but the only rifle cartridge he reloaded was the Eley .577 for a Jeffery double Express rifle, with which he shot bear and moose, as well as Manchurian wild boar. Since he was an Army officer, he had unlimited amounts of the old 220-grain Mosin-Nagant cartridges available, developing then about 2,000 f.s.

I used to play hooky from school quite frequently to help my uncle load shells. He was a believer in accuracy and precision, and, while we measured our black powder with adjustable scoops, he insisted on weighing the shot, since he believed that a small variation in lead by volume resulted in a relatively large variation in weight. This, he claimed caused variation in patterns. Being a stern gentleman of the old school, he impressed these facts on me by making me count the number of No. 7 pellets inside a thirty-inch circle shot at forty meters.

Then one day arrived a shipment of smokeless powders: Ballistite from the U.S.A., Nobel-Eley's from England, Walsrode and others from Germany, and two powders from government mills in Russia—Hawk and Lishev's. With a thousand rounds to be loaded each season for ducks, geese, woodcock, snipe, Siberian blue grouse, partridges, et cetera, weighing became monotonous, to say the least; so an Ideal powder measure made its way across the Pacific. It worked well on small-grained powders like Walsrode, the old Hercules bulk, and the fine black powders; but on the large, flat, square flakes of Hawk, which proved the best powder for heavy loads, my uncle thought the old measure did not perform so well. So he designed his own measure—a prototype of the present Belding & Mull measure, except that it was foot-pedal operated, and the measuring tube slid back and forth with the constant-pressure chamber so that the measured powder was discharged directly into the shell. This made the work fast, but our arrangement for changing various measuring tubes was bad. That was the weak point in our system.

Since those days I have covered a great deal of ground, both in travel and in gun experience, and have used all available powder measures. Some twenty years ago, I became acquainted with that fine artisan, George Titherington, of Stockton, California, and we discussed the matter of better adjustments on powder measures. But it was twenty years later before I finally lost patience and built a powder measure that is a powder measure for the man who has a few guns and uses a number of powders.

Incidentally, the straw that broke the camel's back and set me to work on an accurate powder measure after some twenty years of cogitation and procrastination, was an incident in connection with a job I assumed when I volunteered as unofficial "Consultant in Reloading and Revolver Ballistics" to the Hamden State Police Department. Chief Barrow's expensive Star loading machine was out of whack, his bullet mould poured atrocious light pellets that would hit elsewhere most of the time, but he had a store of primers and empty cases. I sold them the idea of a combination target-and-manstopper load, and offered to load samples for trial. It turned out to be quite a job.

Contrary to warnings in the books, I had talkative assistants, who did help in seating and crimping bullets in the .38 Special cases, but whose conversation lured my attention from the fact that the plunger in my Belding & Mull measure had slipped! The result was that we had to tear apart some 300 rounds to make sure no gun would be blown up. The setscrew was tight and this was the first time that any such thing had ever happened to me—but I determined that it would never happen again. Such mistakes can be very, very costly—in terms of things more important than time or money!

For basic material I selected the Belding & Mull as unquestionably the simplest, most uniform, and easiest to convert, though not the fastest, ready-made measure. To it I added the micrometer attachment illustrated in the accompanying photograph and drawing.

I used Crucible Steel 1.0 per cent carbon tool steel one-eighth-inch drill rod for the micrometer screw. In threading it, I spread the Greenfield die with its adjusting screw so that the screw would have something like a Class 1 fit in the correspondingly threaded hole in the lever or extension fixed to the plunger. (See Part 8 in the drawing.) This is to eliminate end play of the plunger in setting. It is important to cut this thread slowly, with plenty of rocking back and forth, and with plenty of lard oil and turpentine, to make it smooth and uniform.

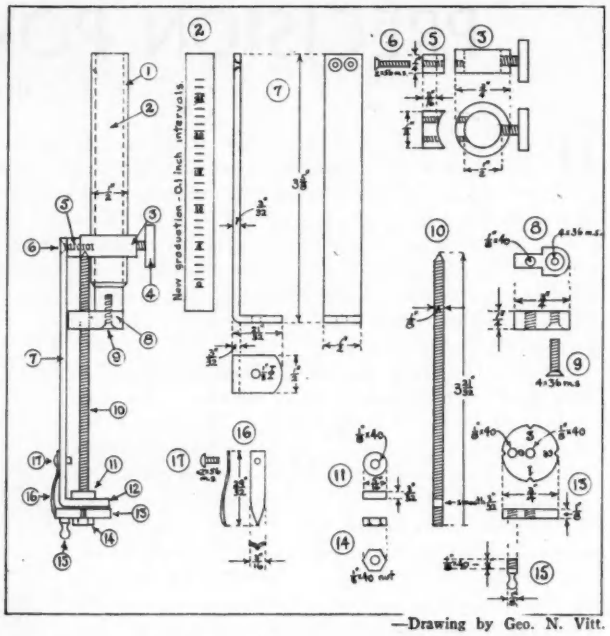
For Part 8, I used a piece of tough Johnson bronze from a large machine bearing, to provide long life and to minimize the coefficient of friction between it and the micrometer screw. All other parts I made of semihard thirty-seventy Chase brass, which works nicely and gives a good finish. The click and retainer spring I procured from an old Baby Ben alarm clock.

Let me insert here a word of warning to the unwary about clock springs: You can easily break off a goodly piece with a pair of pliers, and then shape it carefully on a fine grinding

MICROMETER ATTACHMENT FOR BELDING & MULL POWDER MEASURE

FACTORY PARTS: **1—Brass tube, housing plunger (2). 2—Soft steel plunger graduated 15 divisions per inch. 3—Soft steel ring shrunk on tube (1) to lock screw (4). 4—Lock screw; locks plunger (1) in position.**
CONVERSION PARTS: **5—Spacer block, soldered to ring (3). 6—2x56 machine screws holding together parts (3), (5), and (7). 7—Bracket, held to parts (3) and (5) by two screws and solder. 8—Driven extension fastened to plunger (2) with 4x36 machine screw and solder. 9—One 4x36 machine screw holding parts (8) and (2) together. 10—⅛" driving screw, 40 threads per inch, both ends, except for smooth bearing 3/32" long. Made out of carbon steel drill rod. 11—Thrust collar screwed on part (10) next to smooth bearing and soldered. 12—Integral right-angle extension of bracket (7), hot bent. 13—Handwheel screwed on lower end of screw (10); 4 notches. 14—⅛"x40 nut locking handwheel (13) in place. 15—Handle for wheel screwed in at zero notch. 16—Click and retaining spring with hot-bent V end; lower corner rounded smooth for easy operation. 17—2x56 machine screw for holding spring (16).**
MATERIALS: ***Screw 10*****—preferably carbon steel drill rod, but may be any metal that makes durable smooth thread.** ***Other parts*****—preferably semi-hard brass, but may be any metal that can be nicely worked and finished.**

NOTES: **Make thread on screw (10) full size to eliminate end play of plunger (2) by making neat fit in part (8) . . . Make 60-degree center hole in lower side of ring (3) just 1/16" deep, center being just 5/64 from nearest outside point on tube (1) . . . Solder spacer block (5) to ring (3) and set and adjust bracket (7) so its extension (12) bears firmly against bottom of center hole in ring (3). Then mark and drill holes for screws (6). Solder-sweat these screws to make the assembly permanently adjusted. This prevents end play in screw (10) and plunger (2) . . . Every 16 clicks on wheel (13) moves plunger (1) exactly one inch. Starting from zero, mark the blank flat on plunger (2) every 0.1", as shown. Standardize settings for various powder charges against an accurate balance and tabulate them for ready reference.**



—Drawing by Geo. N. Vitt.

wheel. But when you come to boring holes, the spring must be drawn well to reduce its temper. Here I discovered that the Baby Ben people do give you your money's worth. With very slow cooling after heating to bright red with a torch, this spring was still quite hard. It chipped a carbon steel drill and I had to use a high-speed steel drill containing some cobalt.

The V-section on the nose of the spring, to fit in the generous notches on the handwheel, was a tedious thing to make. I used an old V-block and a cold chisel ground to the same angle and with a dulled rounded edge to prevent splitting the spring. After heating the spring in the torch flame, transfer it to the V-block very rapidly and give it a light tap, repeating the procedure a number of times until the job is done. Then grind the lower corner of the V near the nose of the spring to make it slip smoothly in and out of the deep notches in the wheel. I found the proportions of the spring V and the notch size as shown just right to make any setting very firm and positive, and yet easy to move. The clicks are clean and audible.

I left the factory clamp screw (Part 4 in the drawing) in place for extra protection and also to keep the hole filled. The micrometer bracket could be attached to the tube using the factory-threaded hole already in the ring. The objection to this is that both flats on the round plunger would then face away from you (assuming you are right-handed and hold the device in your left hand when working), making it hard to see the graduations when needed.

Another point of caution: The axis of the plunger and the axis of the micrometer screw must be strictly parallel so that the device will not bind or strain. This means careful following of the drawing dimensions.

Next came the question of graduation. The factory marked the plunger at the rate of fifteen divisions to the inch. Simple arithmetic soon showed me that no commercial threading taps and dies are available to correspond with one-fifteenth-inch divisions on the plunger and at the same time to permit the use of four notches on the wheel, which are easy to lay out precisely without special tools. So I picked the standard one-eighth-inch die with N.S. forty threads per inch. Thus, with four click notches on the wheel, you have 160 clicks per inch of plunger movement, or sixteen clicks per each 0.1-inch graduation. In other words, the plunger moves 1/160th of an inch with every click. Roughly this corresponds to about ten clicks on this new wheel to each of the *old* Belding & Mull one-fifteenth-inch divisions.

I think everyone will agree that it is impossible to set the original measure with an accuracy of 1/160th of an inch—one-tenth of the original division—by eye and setscrew only. How many of you fellows have cursed and sweated, trying to measure near-maximum charges of Bullseye or 2400 or 4227 by comparing what the measure throws with what the balance says, after you loosen the setscrew, try to make your fingers imitate the "micrometer movement," and reset the screw? If your setscrew has worked a few slight depressions in the soft plunger near your favorite load settings, so that the setscrew will not work properly, then you really suffer!

In standardizing and using the measure, as converted, I find that I can switch from load to load, and powder to powder, and hit it every time to within one-twentieth of a grain. Since I know how to count up to 100, I can set the measure precisely every time for the number of divisions and clicks needed.

As to the cost in time and money for making this conversion: Only a few tools are needed. I am a good amateur machinist, and it took me five hours to do what I consider a neat good job. If you go to a good mechanic or gunsmith, who should charge not less than $3.00 per hour for such work, the conversion may cost you about $15.00 in time, plus a few cents for materials. Personally, I consider my time extremely well spent, if only for the satisfaction of knowing that all guesses are out, that the setting cannot possibly slip, and that I can duplicate any given setting at will without using my balance for checking. The design is sturdy, simple, and 100 per cent positive as to accuracy, and I offer it to the shooting fraternity free gratis and with my compliments. ♦ ♦ ♦

JUNIOR COMMANDOS

By E. CHISHOLM THOMSON*

BELLY-CRAWLING UP ENEMY BEACHES at dawn, tommy gun clutched in hand, is a stirring ambition for a boy. Add visions of hand-to-hand combat with enemy Nazis, thrilling street fights where bullets whistle overhead, and you get a limited idea of the thoughts exciting every junior who joins Britain's Army Cadet Force.

Young—perhaps no more than fourteen—these lads are so keen that their officers' main job is to keep the training up to the expectations of the recruits. Cadet keenness has been one of Britain's more startling phenomena ever since Napoleon began being an object lesson to Hitler. The boys of 1800 needed no prodding to join these elementary training units and neither do boys of today. They have the support of the Regular Army, and wear the same battle dress as regular troops.

In World War I these boy soldiers in Britain numbered 100,000. After the final shot was fired in that war, however, the Government—anxious to show its pacific intentions—withdrew support in 1930; the Cadet movement looked like it was dying out. But "old soldiers never die," nor did these young ones. Britain's National Cadet Association was formed to rescue the scattered units and keep the delicate organism alive.

And so it happened that three years ago, when the Government once more wanted cadets, the boys were there—only 12,000-odd of them but a fighting nucleus which has grown now to over 180,000.

Highly trained before reaching Army age, these lads are marked for promotion at the start of their Army career, and the fact that every cadet is a volunteer shows that he is "army-minded." Some become N.C.O.'s immediately; others go to the officer-cadet training units. All are eligible for the Home Guard, Britain's great defense force of "part-time" soldiers.

Britain's cadet force, unlike the Hitler youth setup, is not a forcing ground for unthinking robots, but a very human organization designed to bring out the best in every recruit. In essence, the War Office proclaims that the object of the movement is to give "mental, moral, and physical training to boys, and so form the character of each to enable him to make a good start in life, to develop in him the principles of patriotism and good citizenship, bringing out the qualities of self-confidence, self-respect and ability to face and accept responsibility with the power to control himself and others and then . . . take his place in the defense of his home and country."

As the driving force of the movement in the peace years, the Cadet Association still has a hand in the welfare and games side, but the War Office now supervises the training, making it every cadet's ambition to win his Certificate "A." This is the course which gives him a thorough grounding in modern warfare, including marksmanship. Part I is taken at the age of fifteen and Part II a year later. So trained, he is an asset to any regiment he joins.

Certificate "T" is another coveted prize. This involves a two-years' technical training course which not only fits him for most forms of modern mechanical warfare, but is a good basis for a peacetime trade.

There are some school cadet units, but the great majority are composed of boys already working on war jobs, awaiting the time they are eighteen and able to enter the army proper. These can be helped by grants from the local educational authorities. Camping comes into it, too, and arrangements are made for at least a week under canvas every year to bring the boys face to face with cookhouse problems, night maneuvers and, very often, harvesting to help Britain's farmers.

Here is the weekly diary of a typical cadet, in Edinburgh:

Jimmy is sixteen and a sergeant. His week begins at two-thirty p.m. Sunday when he parades his platoon near the Canongate. At two-forty-five, after roll call and inspection, they march past historic Holyrood Palace to King's Park for company drill, under the eyes of the admiring townsfolk.

Suddenly the parade breaks up on the order, "Under effective fire!" The lads at once flatten themselves on the ground, seeking cover. A mock battle follows, with full scope for infantry training under Certificate "A"—map reading, camouflage, message carrying, field signals, etc., including hand-to-hand combat uncommonly like the real thing.

The boys use .303 rifles and blank ammunition, or, if these are scarce, cavalry carbines. Earlier in the war, when Britain was woefully short of arms, the cadets had to be content with sticks or, at best, dummy rifles.

Within an hour of parade the boys are back at their cadet club for lectures, games, and perhaps a discussion led by the padre. On Monday night a Regular Army sergeant is at the drill hall to instruct the N.C.O.'s in the art of instructing. Tuesday is physical training and swimming night. Wednesday is club night again, with perhaps a table tennis or billiards tournament to be played off. Thursday is devoted to Certificate "A" class and Friday finds Jimmy back in the school hall or playground for company drill. Football with the cadet team fills Saturday afternoon and the evening is given over to entertaining another cadet company from the opposite end of the town. Back late, Jimmy still has a few jobs before bed; trousers to press, boots to polish, and belt and anklets to "blanco."

Such is the life of a cadet in Britain. Throw in a Regular Army assault course or a spell at the Army School of Physical Training—and Jimmy will be well on the way to that beach landing at dawn, or to taking his place as a physically, mentally, and morally fit citizen of Britain at peace. ◆ ◆ ◆

Boys trained to shoot, to obey, to command, to work together as a team, are better fitted to survive in war or to preserve a peace. Is Britain's system the answer for America's postwar-youth problem?—Ed.

* Writer for London newspapers; specialist on military subjects.

Low sights make for easier handling of a rifle in the woods, but do they produce the best results in actual shooting? George Parizek and Carl Swanson present the argument—first, for the man who wants only the answer; second, for the mathematician who wants to know why and how.

LOW SIGHTS OR HIGH?

By GEORGE R. PARIZEK

SOMEONE ONCE SAID, "The best position for a rifle sight is as close to the bore as possible," and 99 per cent of shooters since have accepted that statement as gospel!

Since that time, man has been trying his level best to get the sight line and bullet down the same hole!

Actually, the object of sight-and-barrel relationship should be to get the sights where they will do the most good. Having them as close to the bore as possible is not always the best means of attaining this end. The only relative location of the sights worth considering is that which will place the line of sight reasonably tangent to the trajectory at the range used. This is axiomatic, but not usually recognized.

If we consider satisfactory performance that which will place the bullet within a reasonable distance of the point of aim over the range desired, normal dispersion neglected, we can accomplish much by selecting the height of the sights and fixing them at that position.

Take, for example, the .22 Long Rifle High Speed cartridge. Accepting hits within one-half inch of point of aim, the following indicates practical ranges without sight adjustment:

Type of Sight	Range Yards	Distance Covered, Yards
Open	5 to 55	50
Low Scope	10 to 65	55
Target Scope	15 to 75	60

An extreme example is the .220 Swift. The following data will indicate ranges within one-half inch of point of aim without sight adjustment:

Type of Sight	Range Yards	Distance Covered, Yards
Open	5 to 165 (?)	160
Low Scope	50 to 200	160
Bull Pup (3" sight line)	65 to 250	185

But half-inch accuracy is neither needed nor expected at such ranges. If the .220 Swift were utilized with expected accuracy instead of the ideal one-half-inch striking radius as stated above, the range data will be about as follows:

Type of Sight	Range Yards	Striking Radius	Distance Covered, Yards
Open	5 to 100	1"	95
Low Scope	0 to 200	2"	200
Bull Pup (3" sight line)	0 to 250	3"	250

The accompanying generalized illustration indicates how the sighting line and trajectory affect the ranges which can be contemplated without sight adjustment.

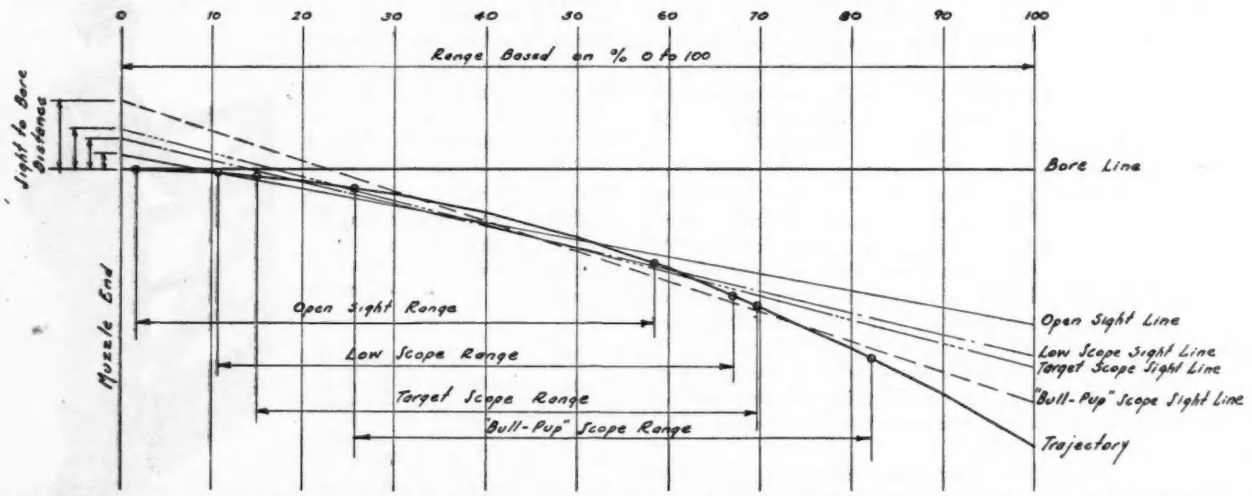
It must be kept in mind that extension of the range limit by raising the sight mounting height also brings about a distance near the shooter over which hits may not be scored within the limits selected.

Obviously, if all shooting is to be done at close range, the old iron sights are ideal. You can't miss, close up, unless you shut both eyes and pull the trigger.

If you like to shoot farther out, mount your sights high and quit worrying about looks. Make the gun fit you.

By judiciously selecting the trajectory, analyzing the range over which you expect to shoot, and selecting your sight height, you can forget about range estimation to a great extent.

As stated before, forget appearance. The Bull Pup and Mr. Johnson's .30-'06 look pretty good to some of us. The sights are plenty high, but the rest of the outfit shows appropriate design. Some of us might even welcome a new "over-and-under"—the stock over, the barrel under—with sights three to four inches above the bore! ♦ ♦ ♦



A generalized graph illustrating the way in which the sighting line and trajectory affect the ranges within the scope of various sight-height adjustments.

The Optimum Fixed Sight Setting for Hunting

By CARL E. SWANSON

LET US DEFINE the optimum fixed sight setting as that which will give us the longest zone within and on the boundaries of which the point of impact of the average bullet will differ from the point of aim by, at most, a distance subtending a minute of angle at the shooter's eye. The minute of angle subtends $\pi/3 = 1.047$ inches per 100 yards of range.

To show how a given rifle employing a given type of ammunition can be sighted so that the bullet's trajectory will conform to the limitations embodied in the above definition, we must obtain certain information about the rifle and ammunition we are to use. First, we must determine the height of the front sight above the center line of the bore; or, if a telescope sight be employed, we must measure the distance between the center line of the scope barrel and the center line of the bore, the measurement being taken at the position of the forward mount. (We shall assume in what follows that the line of sight shall always be such as to pierce the desired point of impact.) Next, we must have the ballistic tables listing the angles of departure in minutes required for each range to compensate for the drop of the bullet caused by gravity.

Given: .22 Caliber Springfield Rifle Model of 1922, employing Lyman 17A aperture front sight for Model 1903. (Height of center of this aperture above center line of bore, 1.14 inches.)
Ammunition: .22 L. R. with m. v. 1050 f. s.

Range in Yards	Angle of departure in minutes
25	4.0
50	8.0
75	12.5
100	17.0
150	26.5
175	31.5
200	37.0

Problem: To determine the best range at which to sight the rifle.

First, plot on a sheet of graph paper the angles of departure in minutes against the ranges in yards, using the information in the above table. This step will give us curve (a) in Figure 1. This curve tells us the angle of elevation in minutes of angle required to overcome the drop of the bullet; but it is obvious that we shall still have to increase the elevation an additional amount if we desire to make the bullet hit the point of aim, for we must make the bullet strike the additional distance higher than the front sight is above the bore. The amount of additional elevation that we must give to accomplish this depends upon the range and is, in fact, inversely proportional to the range.

In the problem at hand, where the height of the front sight above the bore is 1.14 inches, the additional elevation required to compensate for this distance at 100 yards is $1.14/1.047 = 1.09$ minutes. At 200 yards it would have to be one half of that or .55 minutes, while at fifty yards it would have to be twice as much as for 100 yards or 2.18 minutes; at ten yards ten times as much or 10.9 minutes, et cetera. If we calculate thus a number of such points and plot them, we will obtain the curve (b) of Figure 2. Adding curves (a) and (b) together, we obtain curve (c), which is the curve giving the total elevations required to overcome

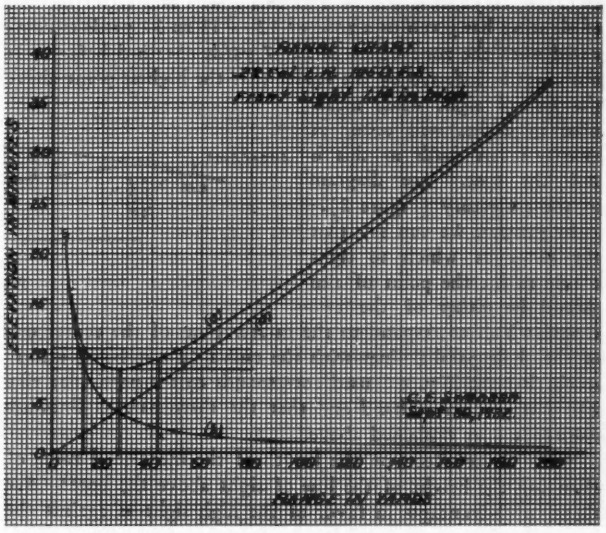


Figure 1.

bullet drop plus the height of the line of sight above the bore.

By constructing the horizontal tangent line to the curve (c) of Figure 1, it is at once apparent that the range requiring the least elevation will be about twenty-seven yards, which corresponds to an elevation of 8.5 minutes. Were we to sight the rifle to hit the point of aim at twenty-seven yards, then the bullet on leaving the muzzle would rise until it touched the line of sight at twenty-seven yards, and then would immediately begin to fall below the line of sight for ranges beyond. Under this condition there would be a zone between sixteen yards and forty-three yards within which no points of the trajectory differ from the line of sight by more than one minute of angle. The figures sixteen and forty-three were obtained from Figure 1 by constructing a second horizontal line one unit (one minute) above the first and observing the ranges corresponding to the intersections of this line and the curve (c). Between the muzzle and the sixteen-yard range the point of impact is in excess of a minute of angle low and the same applies to ranges beyond forty-three yards.

It is at once obvious now that it would have been better from the standpoint of obtaining a longer zone of the type defined if we had sighted in the rifle to hit the point of aim, not at twenty-seven yards, but at some range which would have resulted in a portion of the trajectory being above the line of sight. We must remember, however, that we are restricted to prevent the bullet from at any time being more than one minute of angle above the line of sight.

Construct a third parallel line one unit (one minute) above the second and observe the ranges corresponding to the intersections of this third line and the curve (c), which are thirteen yards and fifty-two yards. Suppose now we sight the rifle to hit the point of aim at either sixteen yards or forty-

three yards (the elevation being the same for both ranges. Then the bullet will climb upwards and, on reaching the thirteen-yard range, will be just one minute low. At sixteen yards it will pass through the line of sight going upward, and at twenty-seven yards it will be a maximum of one minute high. At forty-three yards it will pass through the line of sight descending, and at fifty-two yards it will be a minute low. This latter method of sighting has given us a zone of $52 - 13 = 39$ yards as compared with the zone $43 - 16 = 27$ yards obtained before. It must not be inferred by the reader that the highest point above the line of sight when measured in inches will occur at twenty-seven yards as this is not the case. See diagram of the trajectory (Figure 2).

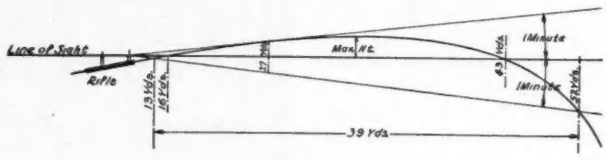


Figure 2.

In general, we can say that the range at which to sight a rifle to hit the point of aim should be either of the two ranges which correspond to the intersections of the center one of the three parallel lines with the curve (c), it being understood that the Figure 1 used corresponds to the particular rifle and ammunition at hand and that the three parallel lines are constructed as explained above.

What is the effect, on the length of the mentioned zone, of changing the height of the line of sight above the bore? Are there any advantages in favor of the high sight as against the low sight for hunting purposes? In this connection it is an interesting observation that, when the above determinations are worked out for the same rifle employing a telescope mounted 1.83 inches above the bore, the previously defined zone is increased in length by four yards, the range limits becoming eighteen and sixty-four yards and the sighting ranges twenty-one and fifty-two yards. Thus the effect is to move the zone out further from the muzzle and to increase its length about 10 per cent.

The question naturally arises as to whether or not there is an optimum height for the sight. An investigation into this problem discloses that there is none; but we shall postpone proof of this matter until later.

The entire problem of determining optimum sight settings yields itself quite readily to mathematical analysis, provided that we make the assumption that the elevations required to overcome the pull of gravity are proportional to the ranges. This approximation is entirely permissible for short ranges, and amounts to saying that we may consider the curve (a) of Figure 1 as being a straight line to about 30 per cent of the extreme target ranges for the cartridge under consideration. We have then:

$y = cx + k/x$ (the equation of curve c of Fig. 1) where c is the ratio of the angle of elevation in minutes to the range in yards for some point given in the ballistic tables (not too far from the muzzle)

and k is a constant involving the height of the sight.

$$k = 100h \div 1.04 = 95.5h$$

where h is the height of the sight in inches
and x is the range in yards
and y is the required angle of elevation in minutes.

To find the value of x for which y is minimum, we differentiate and equate to zero and solve for x:

$$dy/dx = +c - k/x^2 = 0$$
$$\text{or } x = \sqrt{k/c}$$

Substituting this value for x above:

$$y \text{ (min.)} = 2\sqrt{kc}$$

Now let y (min.) be increased by b minutes

where b = 1 if it is desired to find the sighting ranges
b = 2 if it is desired to find the zone limits

We have then

$$y = 2\sqrt{kc} + b$$

To find the ranges corresponding to this value of y we have the following equation to solve for values of x:

$$2\sqrt{kc} + b = k/x + cx$$

Solving by the quadratic formula we obtain

$$x = \frac{(2\sqrt{kc} + b) \pm \sqrt{(2\sqrt{kc} + b)^2 - 4kc}}{2c}$$

This last equation yields two values for x; namely, x_1 and x_2.

As an example of the application of the algebraic solution just given, let us take the problem mentioned in the early part of this paper. There we have

c = 8/50 = .16 (obtained from the ballistic table at 50 yards)
k = (95.5) (1.14) = 109 (where the 1.14 is the height of the front sight in inches.)

If it is desired to get the sighting ranges we place b = 1 and substitute, obtaining

$$x = \frac{9.34 \pm 4.18}{.32}$$

x_1 = 16.1 yards
x_2 = 42.3 yards

(Continued on page 31)

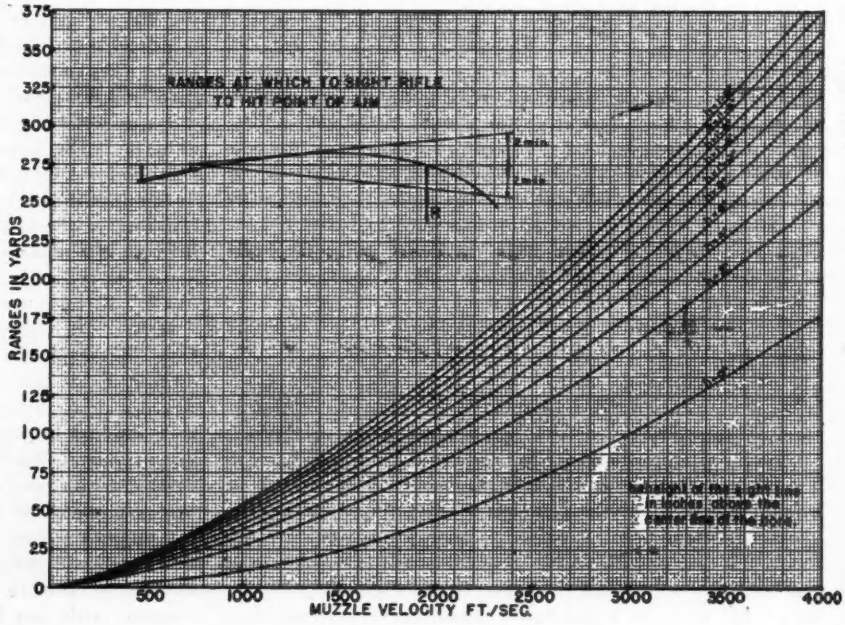


Figure 3.

THAT $896.00 RIFLE

By LT. F. E. STANN, USNR

THOSE OF US WHO HAVE BEEN OVERSEAS on the fighting fronts—and who have been lucky enough to come back—inevitably hear the question, "How does the enemy's armament and equipment stack up with ours?" Few of us, I am sure, are able to answer that question with any degree of authority. And no wonder! An Australian gunnery sergeant I met at Los Negros, on Manus Island in the Admiralty Group, could not agree with his own chief assistant on this subject.

It was their job to defuse, study, and chart all types of Japanese ammunition. With calloused hands—hands vividly yellow due to constant contact with powder and acids— hey disassembled land mines, grenades, mortars, sea mines, torpedoes, aerial bombs, small-arms ammunition, and virtually every type of weapon the Nipponese can throw at us. One morning, shortly after the American invasion of the Admiralties by the dismounted First Cavalry, the Navy's Seabees, and the Aussies, I asked the sergeant how the Jap's stuff compared with ours and with that of the Australians.

"I say, quite well, you know," he answered. "I find fewer misfires, hangfires, and duds than in our stuff—or in yours."

From the adjoining room in the little ordnance shack came a grunt of disapproval. "Don't you believe it, sir," came the voice of the sapper's first assistant. "The Nips have some potent stuff, all right, but not at all in a class with ours."

It was a friendly argument that apparently had been raging for some time. These men, with their helpers, had been through the war up to that point . . . Singapore, New Guinea, the Admiralties. They'd seen much the same things; and, in view of their similar interests and training, they should have seen those things in much the same way. If they couldn't agree, how can laymen be expected to agree on this subject? . . . But their argument was destined to end very soon. It was a genuine shock, the following morning, to revisit that spot and find that all that remained of the ordnance shack were portions of the wooden walls. In the process of defusing a Japanese bomb, a striking pin had hit home. The shack was completely demolished. One of the Australian sergeants was killed; the other permanently blinded.

Most of the questions hurled at returning servicemen pertain to small arms. Rifles, particularly, engage the interest of Americans. This is only natural since America always has been a land of sharpshooters. The mortar and the grenade are weapons only of war, but the rifle is a weapon in peace as well.

Even on this subject I am not an authority. As officer-in-charge of a Navy gun crew aboard a U. S. Army transport in the Pacific, the study of enemy small arms was not a part of my job. This, however, is a story of a young Merchant Marine seaman from the shooting State of Arkansas, and of the Jap .303, the long Arisaka rifle that seems to be best known to Americans. I doubt if the story has a moral, but possibly it may be amusing.

In the process of defusing a Japanese bomb, a striking pin had struck home. All that was left of the shack were portions of the wooden walls.

The memory of Seadler Harbor may have been dimmed now by the ringing victories at Saipan and Tinian and Leyte; but last spring the battle cries of the dismounted Cavalry and of the Seabees rolled across this good but narrow harbor separating the larger island of Manus from the smaller islands in the Admiralty group, such as Pitylu. The islands secured, and the surviving Japs driven into the dense hills, the Pacific Souvenir Exchange probably reached its peak of inflation.

The invaders, American and Australian, set up a thriving business. The market was cornered; they were there first. Fresh troops, sailors off Navy ships, and seamen of the Merchant

Marine, were painfully exposed to trading arts and wiles and to prices that might well have caused Shylock himself to blush. But they were willing customers. After the first captured Japanese battle flags were sold, there was still, mysteriously, no shortage of flags. Not until hundreds more had been sold for fabulous prices was it established that "Jap" battle flags were being manufactured in Australia, shipped to the battle fronts, and palmed off by Aussies and GI's to their buddies as the real McCoy.

This Merchant Mariner, the "hero" of this particular story, just out of school and making his first trip to the Pacific, was one of the eager army of souvenir hunters. Like many others, his goal was a Jap .303 Arisaka rifle. He had hoped that money could buy that rifle but that was before he watched GI's on his combination cargo-transport ship play with the galloping dominoes to the tune of hundreds of dollars a toss. Money buys very little in the South Pacific! A private I went out of my way to meet won $1,400.00 at craps in one afternoon on Hatch Number 3 of our ship, and there is a story of a lieutenant in New Guinea who cleaned up more than $5,000.00 in less than a week. Later, I met this Army genius in the Naval Officers' Club at Milne Bay, New Guinea, and saw for myself the money-order receipt guaranteeing deposit at home. No, money won't buy much in the jungle—but whisky, for instance, will buy a great deal.

An American Army patrol, sent out to round up a prisoner or otherwise obtain a first-hand report on a surviving Jap force of undetermined strength, completed its mission near the shore of Seadler Harbor just as the sun began sinking behind the high, wild hills of Manus. Incredibly tired, men of the patrol threw their packs to the ground and dropped gratefully beside them. One of the patrol, a "dogface" of maybe thirty, peeled off his helmet with a nostalgic sigh. "Gawd," he drawled, "ah'd give every cent in mah pocket for a short bottle of good ol' American cooking whisky."

Less than a yard away, the young Merchant Mariner was all ears. "Wait here," he urged, "I'll be back in half an hour." Then, with a dash, he headed for the beach and the nearest LCI, LCT, or launch he could stop for transportation out to his ship.

It was less than thirty minutes later when he returned, holding aloft a half a pint of very green giggle juice. The bottle bore, however, the label of Kentucky and, without protest, the GI emptied his pocket and reached for the miniature jug. With popping eyes, the sailor walked off counting $112.00 in bills—every cent in the soldier's pocket.

But not even twice $112.00 would buy a Jap Long Rifle. The Merchant Mariner found this out in short order. After a week of determined shopping at half a dozen Army and Seabee outposts, the best bargain he was offered was by an Army second lieutenant—one Jap .303 Arisaka in exchange for two quarts of whisky. At $112.00 per half pint this made the rifle worth $896.00, probably the highest-priced piece of Jap small arms in history.

But that one half pint had been our hero's sole and only supply of whisky—and, with the trade value of that commodity now common knowledge, there was small hope of getting more from shipmate sources. His ship was nearly half unloaded after a week in port and the Merchantman decided that if he was to acquire his rifle he would have to go into the souvenir business himself. Whisky isn't the only high-priced medium of exchange in the South Pacific. Eggs—the old-fashioned kind with shells around them—are precious, too. Coca Cola is another commodity of value. Half a dozen oranges might well bring as much as that first half pint of whisky had done. . . . And, aboard his ship, our merchandizing Merchantman was entitled to his daily portion of all of these gastronomic jewels.

This now becomes a story of self-sacrifice . . . and frustration. For a week, the newly educated young seaman of the Merchant Marine ordered his eggs raw . . . and unshelled. These he carefully stowed in his locker, for use on the open market. He hoarded his "cokes." He pounced upon every loose orange with the greedy enthusiasm of an alert football player falling upon a fumble. And, at long last, he set forth again to do business.

It was a devious course he had to follow! The Army lieutenant wanted nothing but whisky. Eggs, cokes, and oranges would not soften his heart in the slightest—so our hero set about to transmute his baser metals into the necessary (liquid) gold.

His cache finally "bought" a captured Jap field radio, which wouldn't work; a pair of 25 mm. shells, defused and sawed off to represent salt-and-pepper shakers; and a four-inch stack of Japanese occupation money, brand new and utterly worthless.

The radio later "bought" a Jap Officer's pistol, without shells. The pistol, plus the Japanese occupation money, bought one quart of bad whisky, and the job was half done. (One of the 25 mm. shell stumps was found to contain tracer powder. In the process of burning this out the Mariner wound up at the dispensary with two painfully singed fingers.)

But the quest continued. A shipmate not so keenly interested in souvenirs, or not so well informed as to the exchange value, gave up a hidden fifth of a fourth-rate blend on the promise of two for one upon the return to San Francisco; and now, at long last, our guy had his Jap rifle.

He was a proud boy when he carried it aboard. But the more it was displayed the less proud he became. The stock was of the cheapest wood. There were all sorts of gadgets attached, including a tripod, but all were cheap and flimsy. This seaman kid from Arkansas had serious doubts about taking that gun back home where folks knew small arms. He wouldn't be very proud of it there—and he wasn't very proud of it now!

(Continued on page 30)

SO YOU THINK ITS NEW?

Landing barges and smoke screens are commonly thought of as recent developments. Actually, they have been used for centuries. An interesting account of their use, when Charles XII, King of Sweden, fought the Saxons between 1701 and 1706, appears in the Everyman edition of Voltaire's *History of Charles XII*:

"The King of Sweden had great boats made, after a new model, so that the sides were far higher than ordinary, and could be let down and drawn up like a drawbridge. When raised they protected the troops they carried, and when let down they formed a bridge by which to land.

"He also employed another artifice. Having noticed that the wind blew straight from the north, where his troops lay, to the south, where his enemies were encamped, he fired a large heap of wet straw, which spread a thick smoke over the river and prevented the Saxons from seeing his troops, or guessing at his actions. Under cover of this cloud he sent out boats filled with smoking straw, so that the cloud increased, and being right in the enemy's face, prevented them from knowing whether the King had started on the passage or not."—Datus C. Smith, Jr., in *Marine Corps Gazette*.

"SNIPER KILLER"

By SGT. WALTER PETERS,
"Yank" Staff Correspondent

WITH U. S. FORCES IN FRANCE (By Cable) — "It's a beautiful country. Wonderful for snipers, though. From now on, we don't call anybody by rank. It's first names, from the Old Man down. Snipers may be nearby. They like to pick off the leaders."

T/Sgt. Frank Kwiatek, a heavy-weapons platoon sergeant who has spent twenty-seven of his forty-six years in the Army, was doing the talking. We passed a reserve company where some of the men were taking a bath out of their helmets while others wrote letters or cleaned their weapons.

Up ahead there was a clearing in the hedges. We walked through it, crossed another field, and reached another opening in the hedges on the other side. "All those openings were made by machine-gun fire," Kwiatek said.

As we walked up toward the front lines, Kwiatek's eyes darted from trees to hedges and back to trees again, like a hunter looking for a wild animal. "I got a sniper right up in that tree last week," he said. "I guess we have them all cleaned up now, but you never can tell. I'm not taking any chances."

A little later Kwiatek sat down on the ground, pulled out his knife and began cutting a notch in his rifle. "Might as well do this while I have the time," he said. There were twenty-one notches already and he was cutting the twenty-second. "Three more to go and I'll have settled the promise I made when they killed my brother Ted. Then I'll kill twenty-five more for my brother Jerry. I'm going to kill as many Germans as I can, because I hate the whole Nazi system."

Kwiatek was in Northern Ireland with his platoon when his brother Ted, a twenty-one-year-old tank gunner, was killed in Sicily. Kwiatek swore before the men of his platoon that he'd get twenty-five Germans to avenge his brother's death. Several weeks later another brother, ninteen-year-old Jerry, was killed in Italy, and Kwiatek vowed to kill another twenty-five Germans.

So far he has killed twenty with his rifle and two with hand grenades. And he's probably killed "another dozen" with a tommy gun, but he doesn't count them because "when I kill a German, I like to look right into his eyes. I like to see him drop. When he drops, I can almost see my brothers smiling at me. I like shooting snipers especially; they're so sneaky." (Nineteen of the twenty-two notches represent snipers.)

Kwiatek shot his first Germans on June 10 when a sniper stopped the progress of his outfit at a crossroad near Cerisy La Foret. After a number of men had been killed and wounded, the company commander asked for a volunteer to eliminate the sniper. Kwiatek volunteered.

He prowled through the woods until he was twenty-five yards to the rear of the sniper, hidden behind a road marker. The sergeant was just getting ready to shoot the German when he spotted another sniper in a tree about fifty yards to his right. "I shot the sniper in the tree first and then exterminated the one behind the marker."

The sniper in the tree taught Kwiatek a lesson. "I decided that from then on I was going to watch every tree, every bush, and every hedge."

A few minutes later the outfit passed the crossroad, with Kwiatek trailing behind his platoon to give rear protection. "I saw the hedges moving slightly. It was a little windy that day but the wind was blowing from the other direction, so I became suspicious. I tiptoed toward the hedge and saw a German. 'Hey,' I yelled, and when he turned to face me with his rifle ready in his hands, I let go. He keeled over backward. He was a goner —just another dead German. Later, I discovered that he was a captain in the German paratroop corps."

Kwiatek prides himself on being a scientific sniper hunter. "To hunt snipers," he said, "you must use your head. But that doesn't mean you should stick your head over hedges, where the squareheads can take Coney Island pot shots at you. I always tell my men to keep their heads down, but sometimes fellows forget."

Once when one of Kwiatek's men stuck his head above the hedges to shoot, a sniper got him square through the head. "His brains splattered all over my face," Kwiatek said. "I was never so sick in my life.

"Rogers (Pfc. Floyd Rogers of Rising Star, Tex.) and I decided we were going to get that sniper. I told Rogers to take the dead man's helmet and hold it up over the hedge after I gave a signal. I walked forty yards away and then signaled. As soon as the helmet went up, the sniper began shooting and gave away his position. Then I signaled to Rogers to lift the helmet again in another position. When he did, I saw the Hun's helmet come up from behind a tree, then his shoulders. Then I let him have it. All it took was one shot. Those bastards don't give you more than one shot."

Kwiatek, the oldest enlisted man in his outfit, spent nineteen months as a machine gunner in France in the last war. He has been in the same platoon since 1924 and became platoon sergeant in 1940. His daughter is a captain in the Army Nurse Corps in Italy.

Kwiatek's men call him "Hardtack Murphy," a name he used as a welterweight fighter in the Army in the '30's. "He's a damn good platoon sergeant," said Pfc. James W. Justus of Key West, Fla. "The only trouble is, he wants to finish off the war by himself. Every time I see him, he's looking at a tree. He's going to be a very sad man when the war is over and there are no snipers to kill."—From *Yank*. ◆ ◆ ◆

POPULAR SHOT SIZES

AN OVERWHELMING PERCENTAGE of people in our country are faddists. Whether it is in the house we build, the car we drive, the clothes we wear, or the shot we use in our favorite gun, we are very much like a group of school children playing "follow the leader."

In the course of years of shooting, nearly every man will develop a fondness for certain sizes of shot. Perhaps that number happens to fit his gun best, perhaps he has simply shot it more than any other. Be that as it may, he has it in the back of his head how well that size has always performed for him, and he won't use any other number.

Then, too, there is the fact that the gun builder tests his arms with certain sizes of shot. The size is apt to be Number 6 for a duck gun and Number 7½ for a quail gun. These patterns accompany the piece, so the purchaser knows what the weapon did with a certain load, doesn't know what it might do with a different load, and so has a tendency to stick to the factory-tested charge. All of which leads to a good many ducks being shot with 6's, and a good many quail with 7½'s.

In any event, habit is likely to wed us to a few shot sizes. Now and then, of course, a shooter may become finicky and cantankerous and obstinate. Long ago, I knew a market shooter who carried a muzzle-loading 9 gauge. He measured his powder charge very carefully from a flask, but carried his shot in an empty shot sack, into which he poured all sizes of shot from 8's to small buck. In loading, he simply reached down into that sack, grabbed a small handful of shot, and poured them into his gun. He had no confidence whatever in any load that didn't contain every size of shot that he could get hold of! Asked the reason for the mixed shot, he stoutly maintained that the small shot held the large shot together, and that the big pellets would then go away out there 100 yards or so and kill geese.

There is a grain of truth in that seemingly naive contention, though it is probably a very small grain except under carefully controlled conditions. However, if a charge of large shot is placed in a 28 bore tube and introduced into the center of a 10 gauge shell filled with small shot, and if the 28 bore shell is carefully withdrawn, leaving the big shot in the center of the load, nearly all of those large shot will go into or very near the center of the pattern. The reason for this is that small shot take the thrust of initial pressure and contact with the barrel, leaving the big pellets uninjured. Anyway, it works. Try it.

Now and then we discover a man who is wedded to one size shot and one only. A Canadian wrote me once, very seriously, about the advisability of shooting no size of shot other than 7's. He shot 7's at everything from geese to snipe. He shot at the head and neck of geese, and he explained that 7's could not be drifted like smaller shot, hence, were better on snipe and quail.

Way back in muzzle-loading days, and in the days of early breechloaders, the example of such men as Kleinmans, Fred Kimble, and others, led many to prefer Number 3 shot to any other size for duck shooting. I came in contact with the market gunners in my early days, and they were almost unanimous in favoring Number 3 shot. The majority of those men shot muzzle-loaders, from 9 to 6 bore, weighing from eleven to fourteen pounds, throwing a good two ounces of shot. In those guns, no doubt Number 3 did very well. Fred Kimble shot an ounce and a half of Number 3 shot in his old 6 bore, and no other load and no other size shot would suit him. When I got my first 10 bore breechloader, I was told, of course, to use Number 3 shot only. My gun was intended for an ounce and a quarter of shot and, after I had fired, boy-fashion, at a few single ducks sitting on the water and missed clean, I straightway reached my own conclusions about shot sizes and went first to 4's and then to 6's.

A number of years ago, nearly every gunner used Number 8 shot on quail, almost to the exclusion of other sizes. Guns were factory targeted with this size, 450 pellets to the charge, of which about 300 would form the pattern. Number 8 shot are still used largely, but not to the same extent as formerly. Probably half of the quail loads now contain Number 7½ shot, and the percentage may be much larger than that. Half the ducks are now shot with 6's, and there, too, the percentage may be larger. If all quail were shot with 7½'s and all ducks with 6's, we might lose something in patterns with gauges smaller than 16 and something in range with guns larger than 12, but at that we wouldn't lose very much. If we had to, and if we couldn't get anything else, we could get along very nicely with about four sizes of shot: Number 7½, Number 6, Number 4, and Number 2.

I can hear protests right now from the shooter who wishes to use Number 9 in his small bore on quail, from another who wants to use Number 10 on snipe, from the third whose 12 does the best with 5's, from the grouse shooter who has always shot 7's, and so on. But I maintain that we could all get along very well if we did not have the odd sizes. During the last dove season I happened to have a spare case of Number 6 shot, one-and-a-quarter-ounce loads, 12 gauge. I shot them on doves in a Remington shotgun. The big shot killed doves just about as well as any other size. I also tried the 6's on quail in a full-choked 16 bore, and noted very little difference in the relation of number of birds bagged to shells expended.

I once knew a rabbit-and-squirrel shooter who would use nothing but 4's—with which he could and did kill quail. Two market shooters on the Cimmaron River ran out of shells and could buy nothing except Number 7½ shot. They killed 150 ducks in one day and thereafter had no preference as between Number 7½ and Number 6. Number 7 shot was the old pigeon load. In the day of live-bird shooting, rarely any other size was used. 7's will kill a variety of game, including ruffed grouse and prairie chickens; but so will 6's, just as well.

By
MAJOR CHARLES ASKINS

I do not like any size of shot smaller than Number 8 myself in any gun, even a 410. For the sake of the game, in order that birds will not get away hurt, not bagged, I'd like to see all sizes of shot smaller than 8's barred from game shooting. Small sizes of shot pattern densely and will hit birds at ranges beyond those at which they will kill. The man who sees his birds feathered and sometimes killed, will keep on shooting, and he may get some satisfaction out of seeing the feathers fly even if the birds keep on flying; but that's not my idea of sportsmanship.

Number 8 is a good-shooting shot, will pattern densely enough to hit snipe up to at least fifty yards, and snipe are about the smallest game birds we have. I shoot snipe with any quail load I happen to have, and with any quail gun. None of my guns are cylinder bored. For a part of one quail season I did shoot a cylinder, and had a case of shells loaded for it with Number 9 shot. They didn't do any better than the 8's. I sold the gun and quit using shot smaller than Number 8.

Number 6 shot is, I believe, the best size for standard (12, 16, and 20 gauge) guns, and for all pump guns and other repeaters, for any charge of shot up to one-and-a-quarter ounces. Some guns may do better or kill at a bit longer range with Number 5 shot. Now and then we find a crank whose standard prescription is to put in larger shot whenever it appears desirable to increase the range. These gentlemen might, with benefit, scan a previous warning that I have given which indicated that it is not worth while to target BB's at sixty yards, even for geese. The surest way of missing birds—unavoidable misses, no matter how true the hold—is to use shot so large that a cat can be thrown through the pattern without touching a pellet. Very large shot will work on flocks at long range, but not on single birds.

To load, he simply rammed a handful of shot, all sizes, into his gun.

Within the last few years, since the advent of the three-inch 12's, and the output of heavy 10's, using from one and three-eighths to one and five-eighths ounces of shot, Number 4's have become very popular. Probably 4's are the very best size shot for long-range shooting in these big guns, or perhaps either 4's or 5's. However, the cartridge companies ran a bit wild for a while on Number 4 shot and were loading this size in all gauges for duck shooting. One reason for this is that Number 4 shot patterns pretty high percentages and the loading concerns like to be able to say, "We are getting seventy-eight per cent or eighty per cent patterns." However, the eighty per cent of Number 4's is by no means as dense a pattern as seventy-five per cent of 6's, and the 6's will carry a killing energy as far as the average gun will pattern.

Here are the shot sizes that I could do without and not feel their loss greatly. All shot sizes smaller than Number 8; all shot sizes larger than Number 2, including buckshot; and all the odd sizes except Number 5. I could do without 5's, too, in a pinch, though I shouldn't like to have to do so.

Factories vary their shot sizes a good deal without altering their numbers. For example, Number 4 shot, standard, runs 132 pellets to the ounce; but the pellets from some factories may run 146 to the ounce. (Incidentally, this last makes up into a better duck load than the full-size 4's.) In the same way, even Number 7½ shot sometimes runs small. I have seen one 16 bore load which counted 425 pellets to the one and one-eighth ounce—a more effective trap load than the standard size. Some of our best trap shots have decided that they can do better work with Number 8 shot. These shooters would not object to small Number 7½—and neither would the quail shot. The best snipe load in 12, 16, and 20 bores carries a small Number 8, really Number 8½.

Now, where would be the horse sense in going without a shot size that we like, whether or not some other size would do the work? A load with an odd size of shot costs no more than any other. If it suits the man, or the man's gun, no one has the right to dictate to him.

But the cartridge companies have long been trying to standardize their output, and will continue to do so if allowed. They have standardized on the 10 bore shell until it is difficult to obtain cases other than two and seven-eighths inches long. In the same way, it is becoming increasingly difficult to purchase 16 bore shells in any length except two and nine-sixteenths inches. The 20's are gradually becoming standardized in two and three-quarters inches, and the once popular two-and-five eighths-inch 12 bore cartridge is being displaced by the two-and-three-quarters-inch length. The three-inch 12 bore guns are standardized in a case of that length, and longer cases are difficult to find. This tendency is correct. It is a benefit to the gun builder who can chamber for a certain length of case and know that this length and nothing else is going into the

gun. It is a benefit to the shooter, too, in that he will not inadvertently get hold of a short shell to put into his long chambers, and thus ruin his pattern.

Moreover, the cartridge companies are willing and anxious to standardize still further, even to reducing the number of shot sizes in use. There are too many loads and too great a variety of loads; far too many. Here, the dealer comes in to the picture. One man wants a certain load, another a different load, and a third something else. The result is that he has to stock up heavily with a great variety of loads, some of which will be found "dead timber." In order to make up for the loss of shells that are not moving, he has to charge well for what he does sell. The cartridge companies know that, if the dealer could stock up only with cartridges in common demand and not be bothered with odd loads, he would be more willing to engage in the cartridge trade. This applies to all the small hardware stores in our country.

Loading companies tell me that the first step toward the reduction of prices of ammunition must be a lessening of the number of loads issued. If all of us were content with three drams of powder and one and one-eighth ounces of 7½ shot, 12 bore, that would be a great gain in quail loads. But if one man asks for three drams, another three and one-eighth, another for three and one-quarter, some demanding Number 10 shot, some 9's, some 8's, et cetera, in two-and-five-eighths or two-and-three-quarters-inch cases, variety begins to mount! And that is only the beginning of the story. Somebody has to pay the overhead. The factories are not willing to lose, the dealers are not willing to lose—so the consumer loses; loses the cost of all the "deadwood". If the number of loads could be cut down, it is conceivable that a hundred cartridges which now cost five dollars could be bought for four dollars and fifty cents.

If I had no other shot other than Number 7½ and Number 6, I'd get along very nicely. I might have to wait for the geese to get pretty close, but I'd manage. If I could have but *one* size shot, that would be Number 6. I'd still be all fixed for ducks; could kill quail fairly well and would be right at home with pheasants, ruffed grouse, and chickens. Snipe might get away from me pretty often, but they do anyhow sometimes.

What I am trying to emphasize is that, if we could find some prominent field gunner who could sell the idea that we do not need a different size shot for every bird that flies, nor a different powder charge, it would be a case again, among shooters, of "following the leader." It would also reduce our hunting expenditures; and it would relieve the factories of a perpetual headache. ◆ ◆ ◆

That $896.00 Rifle

(Continued from page 26)

In less than an hour, that Jap .303 was on the market again.

Don't get me wrong. I have seen what the Nips can do. They are good, and so are their instruments of destruction. More than once I have assisted in defusing knee mortar and heavy mortar shells and 25 mm. and 37 mm. shells. Some have right-handed threads and some have left-handed threads. Often the same fused projectile will have threads that turn both ways. They are very difficult to tear down—and doubly dangerous because of it.

But without attempting to go into relative muzzle velocity or anything else of a technical nature, give me the good old American stuff. I have seen what our guys have to shoot, too, and by now the Nips should and do agree that our brand is about as good as anything there is in the Pacific theater of war.

But to complete the saga of our Merchant Mariner. Six weeks after the Jap .303 became his prized possession. I met another shipmate of his in San Francisco. The conversation naturally embraced the historic quest that started with half a pint of whisky and wound up with the acquisition of that "$896.00 rifle."

"That was a deal," laughed this shipmate. "Too bad you weren't in on the finish. Just before we 'pulled the hook' and started east, he swapped his Jap Long Rifle with a little colored kid in the Seabees for one of our .30 caliber carbines. 'Now there is a gun,' he used to say on the trip back. 'This is one that'll make them folks back in Arkansas sit up and take notice! Fifteen rounds in a clip, and all compact as hell, with no tripods, corkscrews, shaving mirrors or ten-cent-store doodads!'

"I guess he cleaned that carbine every day. The Navy gunner's mate was threatenin' to charge him for mineral oil expended. He used to pose behind the kingposts, like he was stalking game, and bang away in dry runs. He had a wonderful trip home. But . . . then we docked."

"And then? Didn't he get his leave and go back to Arkansas? Surely, after all that—!"

"Yeah, he got his leave. And he's in Arkansas. But here he went and ran a broken Jap radio, a couple dozen eggs, a few oranges, and two burned fingers into a rifle he figgered was worth $896.00—then he swapped that big piece of junk for a carbine with a burred breech—and then, after we docked in the States, he found out that after the war, a carbine, new, won't cost no more'n five bucks! But that ain't the worst of it. That ain't the end of the story. . . ."

"No? What next?"

"Next, the Coast Guard comes aboard and takes the carbine away from him as being Gov'mint property!"

"So?"

"So he buys two quarts and a pint; two quarts to pay what he owed—and the pint to drown his sorrow!" ◆ ◆ ◆

Optimum Sight Setting

(Continued from page 24)

If it is further desired to get the range limits we place

$b = 2$ and substitute, obtaining

$$x = \frac{10.34 \pm 6.07}{.32}$$

$x_1 = 51.3$ yards

$x_2 = 13.2$ yards

It is seen that the solutions by algebra check almost perfectly with those obtained by the graphical method, as should be expected.

Subtracting the two roots of the above quadratic equation:

$$z = x_2 - x_1 = \frac{\sqrt{(2\sqrt{kc} + b)^2 - 4kc}}{c}$$

the zone in yards. A differentiation of this function or even an inspection of it reveals that z does not attain a maximum but increases without limit as b increases, thereby proving that there is no optimum height of sight but that the zone increases as the sight is made higher, the sight height being limited by design of stock (comfortable holding), et cetera.

Calculations such as the above have been made by the writer on his .22 and .30 caliber NRA Springfield rifles employing both low and high sights, and these calculations have been checked by actual firings. In all cases, the checks have conformed perfectly to the predicted performances, group diameters in no case being in excess of two minutes of angle.

It is to be noted that the zones resulting from optimum settings are remarkably long and that they embrace the ranges over which by far the greatest percentage of hunting is done. In the case of the .30 caliber Springfield Sporter fitted with a front sight 1.14 inches high, the sighting ranges become thirty-one yards and 141 yards and the zone limits determined are twenty-five yards and 180 yards when using 2,700 f.s. 172-grain boattail ammunition. A maximum deviation from the point of aim of one minute is an exceedingly small amount, especially under hunting conditions, so the reader may choose his optimum definition on the basis of a two-minute maximum deviation and make his calculations or graphical construction accordingly. In this case, the value of b in the formula becomes two when solving for sighting ranges and four when solving for zone limits. Obviously a considerably increased zone will result. For calculations involving the .30 caliber M1 service round, the value of c is approximately .025.

A graph has been prepared (Figure 3, page 24) which gives the ranges at which one should sight his rifle to hit the point of aim, so that he will confine the trajectory to a maximum angular height of two minutes above the line of sight. This graph represents the solutions of the problem when placing "b = 2" for sighting ranges. ♦ ♦ ♦

Postwar Planning

(Continued from page 16)

2. Permits the secretary to have a permanent office with proper filing and working space in which to conduct the club's business.
3. Provides proper storage space for the equipment required to handle Registered Tournaments.
4. May be quickly converted from a comfortable clubroom into an efficient Registered Tournament office—and vice versa, as circumstances require.
5. Establishes a small kitchen or "galley" as a permanent part of the club's facilities.
6. Provides clean toilets and lavatories for men and women.
7. Is so designed that all these features can be integrated into a larger clubhouse as the club grows. The money invested in this small clubhouse will not be wasted by reason of having to tear down and rebuild when the club can afford larger quarters. Subsequent plans will show how this integration and expansion can be carried out.

This building is recommended for small clubs having fifteen to twenty-five targets normally in use and not more than fifty targets in use on Registered Tournament days. Its setup for normal clubhouse purposes is evident from the floor-plan sketches.

When the building is transformed into a Registered Tournament office, the collapsible furniture is set up and the lounge furniture pushed aside. Two windows at bank-counter height are located facing on the east porch for the taking of entries. These windows are in the office where the squadding is done. Out in the large room the work space is set up as follows: At the smaller of the two tables near the west windows, new targets are marked with target and competitors' numbers and placed on the window counter. They are picked up from there by the target runners and taken to the firing line. After firing, they are brought back to the adjacent window where they are picked up by the "comparer." The comparing is done on a specially designed table with a glass "window" brightly lighted by fluorescent tubes. The targets then pass to the scorers at the next table. Having been scored, the targets for each relay are taken to the posting table for preparation of bulletins and other statistical work. The targets are then filed for quick reference in case of challenges. The work space is laid out so that none of the statistical personnel works facing outside light. There is ample space along the porch walls for the posting of bulletins. The tables and windows at which the target runners work are located on the west side so as to be more or less secluded from the shooters lounging area.

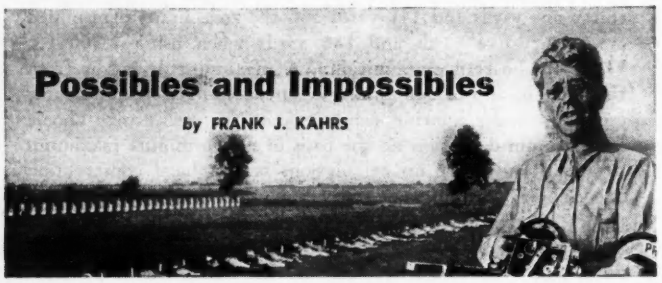
The refreshment galley is placed so that it is convenient for serving refreshments even when the clubroom is being used as a statistical office. Competitors are kept out of the building during competitions. Porches are provided for the shooters lounging between matches, and for guests.

Plans for an indoor range and clubhouse will be published in April, or as soon thereafter as possible. In the meantime, the Association will be glad to assist clubs with the architectural or engineering problems involved in specific local situations. Write us, and let us help you prepare to meet the postwar boom in shooting interest. ♦ ♦ ♦

A PAPER FOR PEOPLE WHO SHOOT

Rifle Remington

VOL. 8, NO. 2 First Class Reading Matter for Rifle Shooters BRIDGEPORT, CONN., FEB



Possibles and Impossibles

by FRANK J. KAHRS

One of the outstanding civilian achievements in wartime rifle shooting instruction has been done at the University of Chicago, where they have a training program really worthwhile.

The University of Chicago Rifle Club has trained approximately 15,000 riflemen since September, 1940. Yes, I said 15,000. Of this number, 2,000 were in the Air Corps, Army, Coast Guard, etc. The bulk of the training was done with 22 caliber rifles, but in the case of the Air Corps they got 30 caliber carbine, 45 caliber pistol as well as Thompson Sub-Machine Gun. The classes range from 50 to 150 men.

The results of this training were very interesting. In 22 caliber, 99% of the shooters qualified as Expert Riflemen. With 45 pistol, about 90% qualified and approximately 25% Experts. With the Carbine, 99% qualified. There was no qualification with the Thompson Sub-Machine Gun. They simply got acquainted with its fundamentals.

Many interesting angles of this training program developed from time to time. One of these is that nearly all dry training can be done with a wooden gun, especially in the early stages when the trainee is likely to mishandle and damage a regular piece. This saves the actual rifle. The wooden gun permits tremendous expansion that would not be true with regular rifles. Everything can be done with a wooden gun except trigger squeeze, rapid fire, bolt manipulation and actual firing.

It was fortunate that the State Association could loan experienced members as instructors from time to time. If it had not been for the N. R. A., the course would not have been possible because there would have been no ammunition.

There is no doubt that many changes in existing rules and types of shooting must be made after the war, and that is the opinion of those who have been active in the University training. It is also fortunate for the University of Chicago that there are some local shooters with enough energy and interest to make all this possible.

On October 28th last, a class of approximately 410 men started off for the eight weeks course, three hours a night, and that, gentlemen, is an example of the kind of work our universities and colleges are doing to help win the war.

* * *

In Wilmington, Delaware, there's a Boys' Club and a very active one, too. There is nothing very remarkable about that statement or the fact that there is a Boys' Club in Wilmington, but when you consider that in this club there are 184 boys who were in camp last summer and 99 per cent of these boys took advantage of the opportunity to shoot on the rifle range to qualify for pro-marksman to expert, that's something else again.

Forty-three boys completed 119 qualifications and one boy actually achieved the signal honor of being the first lad in Delaware to become an expert rifleman. While I don't know his age, I judge that this boy is only 14 or 15 years old, and there is another boy in the club, 10 years old, who is approaching the goal by slowly completing the last set of 10 targets from the standing position.

The Senior Camp Team of this Club finished in a tie for 11th place in the National Summer Camp Rifle Match.

You can rest assured that the reason for the interest in the club is due to the efforts of the supervisor in charge, but once the shooting was started, the interest and enthusiasm grew of their own accord.

PISTOL SHOOT

PISTOL SHOOTERS LIKE "TARGETMASTER

10-shot group at 50 yards with Remington 22 long rifle Police Targetmaster ammunition.

BRIDGEPORT, CONN., February, 1945.—Match competition among pistol shooters demands the utmost in the accuracy of the ammunition. The ability of the shooter to score extremely fine groups must be equaled by the perfection of the ammunition. Pistol shooters who have used Remington Police Targetmaster know the dependability of these cartridges, and appreciate ho they have contributed the share to the winning of ma important pistol matches.

Shooters are urged to u Police Targetmaster ammu tion when it is available aga to assure maximum accura and tight groups.

TARGETMASTER is Reg. U. S. P Off. by Remington Arms Co., Inc.

THERE'S ONE IN EVERY CLUB . . . . "Jesse James"

...ton News

CONN..., FEBRUARY, 1945

FREE: To Readers of American Rifleman

WEATHER:
B-29 CLOUDS AND INCENDIARY FLURRIES OVER TOKYO

...ING GROWS MORE POPULAR

AUXILIARY POLICE UNITS AND WAR PLANT GUARDS DEVELOP NEW INTEREST IN ART OF SHOOTING SIDE ARMS

CROSSTOWN, U. S. A., ...ebruary, 1945. — In recent ...ears, pistol shooting as a ...port has become increasingly ...opular. Campers and fisher...en revived the habit of carry...ing a side arm, not just because ...t came in handy at times, but also because they found plinking with a pistol, in idle moments, an interesting and thoroughly enjoyable recreation. Then, when the United States entered the war, interest in pistol shooting took a sudden upward surge.

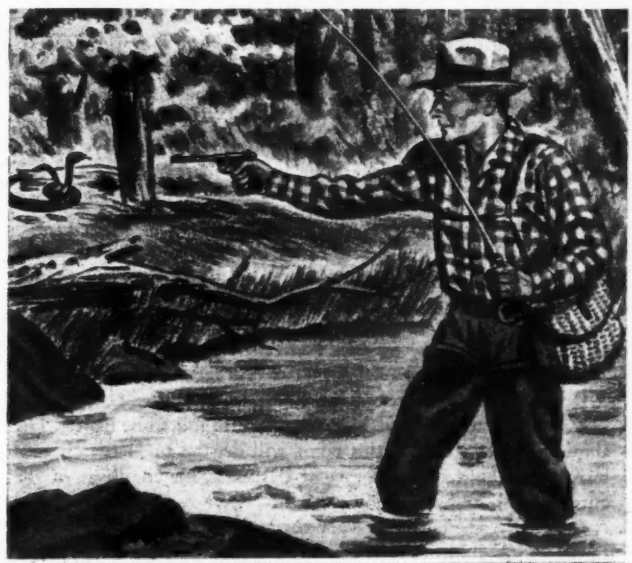
Various home defense units were organized throughout the country, including the Auxiliary Police to supplement regular police forces. Although the principal duty of this organization was to aid in emergencies, particularly in the event of an air raid, so much interest was shown by the members that their training program in many cases was elaborated to include pistol shooting.

Groups in various communities met one night a week and received training under the guidance of local police, in some cases, and by NRA members, in other instances. Many of these men had never handled a pistol before, yet were so enthusiastic and practiced so vigorously that it wasn't long before inter-community competitions sprang up in many states. The prime purpose of teaching these men the art of pistol shooting was home defense, but many of them now have a keen interest in the shooting sports.

Increased popularity of pistol shooting has resulted from the need for armed guards in many industrial plants producing war materials. Thousands of men have been employed as guards and most of them carry side arms. They were taught the rudiments of pistol shooting and, in many areas, formed company teams which engage in competition with other company teams, local police and auxiliary police teams.

All of these recent developments have tended to increase the popularity of pistol shooting. The encouragement of large groups of active new shooters will help to swell the ranks of rifle and pistol clubs everywhere. Many NRA members have had the opportunity of teaching some of these new units and have recruited many of their proteges into local established clubs.

Those interested in developing pistol shooting and equipping their clubs with specifications required for pistol ranges are invited to write: Law Enforcement Officers' Section, Remington Arms Co., Inc., Bridgeport 2, Conn.



Blueprint Available For Clubs Interested ...n Lighting System ...or Night Shooting

BRIDGEPORT, CONN., ...ebruary, 1945.—The Reming...on Rifle News for October, ...944, told how a club in Kit...anning, Pennsylvania, had in...talled lights for night shoot...ng. Since then, we have re...eived quite a few inquiries ...om clubs interested in in...talling a similar lighting sys...m. So we have prepared a ...lueprint showing just how to ...o it, giving complete details ...nd it is free for the asking to ...y club interested. Just drop ...line to: Rifle Promotion Sec...on, Remington Arms Co., Inc., ...ridgeport 2, Conn.

Rifle Barrel Deflection

By J. R. HELMS

IN THE MASS PRODUCTION of rifle barrels, approximately fifty operations are employed in processing the rough blank into an accurate firing instrument. Throughout the processing, machine tools are constantly exerting an external pressure at right angles to the barrel. This pressure tends to bend and twist it throughout its length.

The question is often raised among specialists in the small-arms field whether, in the absence of annealing, internal stresses are not present due to irregular cooling of the blank during forging; and whether, when the rifle is fired, these strains are released, causing a constant force that tends to bend or warp the barrel.

After a blank has been cut to size, it is placed in a deep-hole drill and drilled throughout its length. The hole is usually .010 inch less in diameter than the finished bore before rifling. Three reamings are usually employed to bring the bore to final diameter. The drilling of the blank determines the longitudinal axis of the bore, which is the basic line to which all external lateral measurements on the circumference of the barrel should center.

The bore of a rifle barrel when first drilled and before turning on a lathe will be found to be straight in ninety-five barrels out of a hundred. However, the axis of the blank and the axis of the bore will not in the majority of cases coincide; and, when the barrel is placed between lathe centers for turning, the external circumference of the barrel will be eccentric in its rotation. This eccentric rotating of the barrel will not always be corrected by the subsequent machining to size. Thousands of barrels are in service whose center of circumference fails to coincide with the axis of bore from .010 to .050 inch.

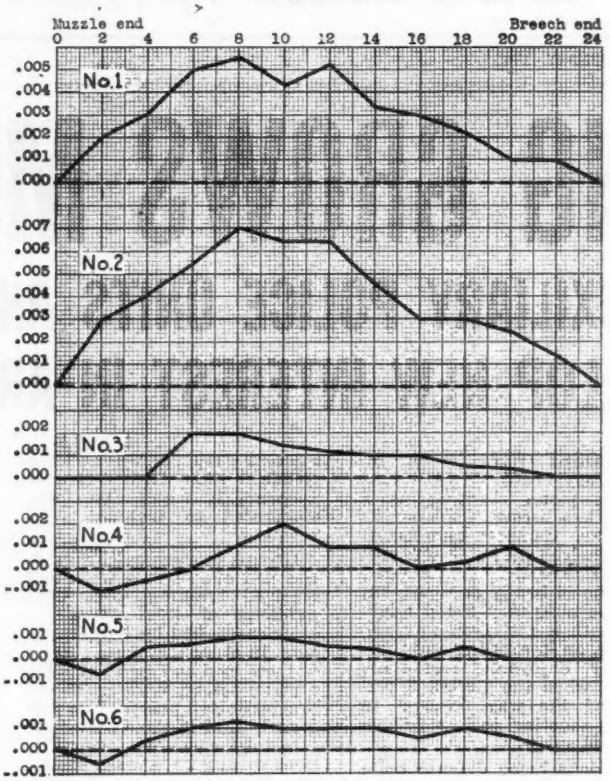
After drilling, the barrel is placed in a lathe and excess metal is removed to a predetermined, but not final, size. After this operation the majority of barrels will be found to be bent. The amount of deflection at this point will depend upon the characteristics of the steel, the degree of elasticity, the condition of the cutting tool, and the amount of off-center rotation.

Internally, the bore may vary throughout its length from .001 to .016 inch from its true axis. To insure that the axis of bore and the axis of rotation coincide in the final turning, the barrel must now be straightened.

Rifle barrel straightening is one of the most exacting skills employed in the manufacture of small arms. At the beginning of World War I there were seven barrel straighteners in the United States. One of these, formerly employed at the Rock Island Arsenal, was retained by the Remington Arms Company at Eddystone, Pennsylvania, to train straighteners on Enfield rifles, then being manufactured for the British Government, and later to straighten modified Enfields for the American Army. Out of a group of several hundred trainees, fourteen men were developed who were capable of straightening a finished barrel.

Two methods of indicating the deflection of a rifle barrel bore are employed. One method is used in ring straightening. The second, and the one most widely employed in the United States, is used in line straightening.

When a plain-bore barrel, after reaming, is sighted at an angle toward a source of light, a series of light rings spaced at equal intervals will be reflected within the bore, extending in depth to one-half the barrel's length. Upon rotating the barrel, if the bore be bent, the light rings will appear to rotate eccentric with each other. If the straightener be of the old school, he will place the barrel upon two lead blocks placed in a hollow anvil, will strike the barrel a series of light blows with a lead or bronze hammer, inspecting after each blow until the rings, upon rotation, will assume a concentric position.



Graph No. 1: First straightening. Deflection from 6 toward 12 o'clock. *Graph No. 2:* Secodn and final straightening. Deflection from 3 toward 9. *Graph No. 3:* After proof firing. *Graph No. 4:* After proof firing and ten service rounds. *Graph No. 5:* After proof firing and forty service rounds. *Graph No. 6:* After proof firing and 140 service rounds.

In line straightening, an entirely different principle is employed. A location is selected in the plant, preferably facing a north light, free from noise, glaring lights, and other diverting influences. An eighteen-by-twenty-four-inch frosted glass window is installed, and a five-sixteenths-inch-wide opaque horizontal crosspiece is placed at its center. (The width of the crosspiece may vary according to the preference of the individual straightener, since the width governs the thickness of the lines within the bore.) The straightening jack, a device similar in performance to an arbor press, is placed eighteen feet from the window. At this distance, when sighting through the bore at a point three and one-half inches below the crosspiece, two shadows the thickness of pencil lines will converge at the muzzle end, forming an angle with the vertex at the bottom

of the bore, the sides extending backwards and slightly up the sides of the bore, giving the appearance of an inverted V when viewed from the breech end. The lines will extend approximately one-half the length of the barrel and, if the bore is straight, the lines will maintain a symmetrical position as the barrel is rotated. If there are twists, bends, or other distortions present, the lines will vary in their relative positions.

The straightener now revolves the barrel until the lines assume their narrowest position, thus indicating that the deflection within the bore is downward and in a position to be struck with the jack, the hammer head of which strikes upward when the jack is in action. Starting at the center and working toward the muzzle end, the barrel is given a series of blows of sufficient intensity to spring the lines into a fixed position upon rotation. The barrel is then reversed and the other half straightened.

Only an experienced straightener, with an eye capable of withstanding prolonged strain, with judgment and technique acquired from straightening thousands of barrels, is qualified to straighten and give final visual inspection to a finished barrel.

Some manufacturers of rifle barrels use a plug gauge to determine the final accuracy of the bore. Inspection plugs for caliber .30 barrels are ten-inch hardened steel rods with a diameter of .2995 inch. Such a rod should fall freely throughout the length of a barrel under its own weight if the bore has been properly straightened and given a final ream to .300 inch. In the manufacturing of barrels, .0005 of an inch oversize is permissible in final reaming. However, the use of such a gauge with a barrel reamed to .3005 inch will permit a gradual deflection of .003 inch at the middle of a twenty-four-inch barrel, whereas a trained inspector will detect a deflection of less than .005 inch.

After first straightening, the barrel is placed upon a lathe and turned down to final size. A rough finish may be given with a file as the barrel revolves and, if a finer finish is required, it is accomplished by burnishing with emery or crocus cloth. (The Enfield barrel was tooled to finished size by means of a grinder.) The bore is then given a final straightening, reamed to size, and is ready for rifling.

Recognizing that a barrel blank is subject to internal stresses upon cooling after having been forged or hot-rolled, and that subsequent turning to size subjects the barrel to further stresses, will the bore maintain its precision in service, regardless of the accuracy of the final straightening?

To determine the behavior of barrels under fire, I recently supervised a series of tests on badly distorted barrels.

A selection was made, after first turning, of the worst conditions found among several thousand barrels. The barrel was clocked by stamping numerals upon the breech end. By placing the barrel on centers and by means of an indicator gauge, readings were obtained after each test, which furnished data for the series of graphs shown.

The first readings made at two-inch intervals from the outside of the barrel revealed that the initial deflection was greatest eight inches from the muzzle end. Line inspection confirmed this observation. The deflections were plotted on Graph No. 1. The barrel was straightened, turned down to final size and again gauged for deflection and inspected.

Whereas the barrel had been deflected after first turning from the six toward the twelve o'clock position, after second and final turning the direction of deflection was from the three toward the nine o'clock position.

The indicator gauge established that the point of greatest deflection was again eight inches from the muzzle end and this observation was sustained by visual inspection. These findings were plotted on Graph No. 2. The barrel was given a second and final straightening, reamed to .300 inch, inspected on the lines and tested with the gauge for accuracy, rifled, completed, and assembled for test firing.

The first shot on the firing range was a test round, developing an internal pressure of 68,000 pounds per square inch.

A study of Graph No. 3 reveals that, for four inches from the muzzle end there was no deviation from the plotted straight bore. At six inches, there was a deflection of .002 inch, which decreased to approximately .0005 inch at fourteen inches, then tapered to zero at the breech. The barrel was assembled and ten service rounds fired, developing internal pressure of 48,000 pounds per square inch.

Graph No. 4 reveals that there was an apparent .001-inch deflection two inches from the muzzle, receding to zero at six inches and deflecting again .0015 of an inch in the opposite direction ten inches from the muzzle end.

Forty additional rounds were fired and readings plotted on Graph No. 5.

The .001-inch deflection two inches from the muzzle end registered in the previous test had now receded to .0005 of an inch, tapering to zero at three inches. A deflection of .001 of an inch in the opposite direction was registered eight inches from the muzzle, tapering to zero at the breech.

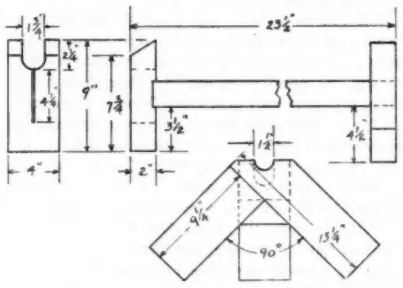
Finally, one hundred service rounds were fired in rapid order, thereby subjecting the barrel to extreme heat. The barrel was quickly dismantled and, while under exceedingly high temperature, was thrust into a keg of cold water. It was then placed on centers and final readings with the indicator gauge were registered at two-inch intervals. The deflection two inches from the muzzle again registered .0005 of an inch, crossing the true axis four inches from the muzzle to deflect a maximum of .0015 of an inch eight inches from the muzzle.

The bore was then inspected on the lines. On the rifled surface of the bore no deflection was apparent and the plug gauge dropped freely through the length of the barrel.

The test indicates that, regardless of the stresses endured in manufacture, after final straightening, the longitudinal axis of the barrel remains true according to accepted standards of accuracy under the most extreme and prolonged action. ♦ ♦ ♦

FORT BELVOIR REST

When the ancient and honorable ammunition box and other makeshift forms of rests for sighting triangulation tests proved inaccurate, weak, and otherwise unsatisfactory, the boys at Ft. Belvoir devised the sturdy, stable, and highly efficient rest illustrated in the drawings reproduced herewith. Built of "two-by-fours" solidly joined in the split-clothes-pin principle of the holding wedge, this rest will support a 200-pound man standing on the rifle in the rest. (The rest is not for shooting, but for sighting groups or triangulation tests only.)



POWDER SMOKE: READERS COMMENTS THE NEWS DESK

WE HELPED

Washington, D. C.

Editor:

As the New Year begins, I would like to extend the warm thanks of the Treasury Department for the outstanding contribution . . . made to War Finance during 1944. . . . You have played an indispensable part in the gigantic sales program (of War Bonds). Your publication belongs in the front row of those who have made possible this support.

Thomas H. Lane, Director,
Advertising, Press, Radio—Treasury Dept.

GOLDEN BULLET

Along the Ledo Road, North Burma.

Editor:

It has been a long time since the last Intercollegiates I shot in. That was the match in which I shot my first and last "possible" kneeling. . . . I write Master Sergeant Gasda now and then (you'll remember him as Lehigh's coach) but he is too busy to correspond much. . . . Major Ed Lawler, pistol shot from the Pennsylvania State Police, is located not far from here. . . . I brought overseas with me a .45 M1917 revolver which was purchased in 1930 through the DCM. I sold it here for Rupees 700—about $210 in U. S. currency. That's one for "The Arms Chest!" . . . I'm looking forward to postwar matches.

Dave Smith.

Dave Smith, Lehigh junior, gets his second straight Golden Bullet after another brilliant season. Lost his National Individual title won in 1940, but averaged 281.2 in shoulder-to-shoulder matches. June 1941 RIFLEMAN.

LIKE FATHER, LIKE SON

Wheeling, West Virginia

Editor:

My son Tommy joined the NRA Junior Division at the age of 5½ years. In 1940, he cleaned up in the junior matches at Perry. He got his Assistant Rifle Instructor's Certificate and Senior Membership last May. He went into the Navy's Amphibious Forces on his seventeenth birthday and, as a result of his NRA experience, was quickly promoted to the grade of Gunner's Mate Third Class.

But it was at Tarawa, Eniwetok, and Saipan where his individual marksmanship training really paid off. He told me while home on survivor's furlough last September that all the rifle training his unit got was what he gave them in their spare time and that, if he hadn't learned to shoot and to instruct in our NRA schools here before he signed up, his outfit wouldn't have known anything about a gun. He was with a Beach Party assigned to land with the Marines at Tarawa and later at Eniwetok. At Eniwetok, his unit was recommended for the Presidential Citation. They went to the aid of a detachment of Marines on the beach and really made the Japs pay up for losses we suffered at Tarawa.

At Saipan, where he was serving on an LCT, he got two Zeros with a 20 mm., out of a flight that got through to strafe them. Later, three Jap Bettys got the LCT with a direct bomb hit, but they were picked up and put ashore in time to help stop a suicidal Jap counter-attack.

Tom is back in the Pacific somewhere now, I suspect around the Philippines; but while he was home he told me enough about the need of proper marksmanship training in the Navy's Amphibious Forces, and of how his own previous training paid off, that I will feel forever grateful to the NRA for their long range program to teach Americans to shoot.

Charles M. Kronk.

Meanwhile, NRA Senior Rifle Instructor Cronk is doing his "bit" at home. Captain of an infantry company of the West Virginia State Guard, Cronk put his men through an NRA-certified Pre-induction Training School under experienced NRA instructors, took his Company to State Guard training camp, and won Company Championship against twenty-three competing companies, qualified a greater number of men than any other company, won a five-man-team challenge match and, himself, fired the highest individual score.—Ed.

WIRELESS FROM LUXEMBOURG

VIA PRESS WIRELESS, January 10, 1945: Rifles and machine guns in the hands of brave men saved the city of Luxembourg. Engineers, MP's, cooks, even this regiment's Cannon Company fired rifles to hold the line. Basic rifle training proved never more essential and officers' appreciation of small-arms possibilities was the deciding factor in the decision to stand.

This Fourth Division regiment, spread along a twelve-mile front, held against four enemy regiments. Some outfits lacking appreciation of the strength of small arms did not attempt to hold. Here, fifty-four men held three German battalions by long-range shooting. Men never believed it possible until they tried it—but what a boost to morale it was! Our Cannon Company's 105 howitzers were surrounded but held off two charges with rifle fire; then, when Germans set up machine guns, they fired the 105's point-blank for tree-bursts (causing high-explosive shells to burst by contact with three branches over enemy positions.—Ed.) and mortar men unhooked their tripods for flat trajectory to do the same.

Cannon Officer Lieutenant John Cooke, of Gatesville, Texas, was cut off from his outfit but, with his rifle, shot Germans like deer as they ran across a garden—then dashed through and saved the guns.

One-time Junior NRA member W. C. Schumann, of New Rochelle, New York, whose dad owns a sporting goods store and encourages hunting and target shooting, shot up three machine-gun crews at ranges of from 600 to 900 yards, killed a German artillery observer in a window 900 yards away (located when his glasses glinted in the sunlight), and scored a dozen other similarly spectacular hits during the five-day siege. The men say he's the best shot in the outfit!

—By BILL SHADEL.

ROUNDUP

Major General Julian C. Smith, USMC, after commanding the 2nd Marine Division at Tarawa and Saipan, now commands the Department of the Pacific with headquarters in San Francisco.

Vice Admiral W. A. Lee, USN, set the rifle shooting world by the ears in 1907 by winning the National Individual Rifle Match when he was a Midshipman at the U. S. Naval Academy. On duty in Washington at the time of Pearl Harbor, Lee, then a Rear Admiral, was largely responsible for the initiation of the present Navy small-arms training program. Leaving Washington at the first opportunity after the outbreak of hostilities to take command of a battleship division, he has risen to the rank of Vice Admiral and a position on the Naval Staff controlling Pacific operations.

Major General Julian S. Hatcher, Ordnance, USA, after establishing the highly successful Ordnance Training Schools at Aberdeen, Maryland, has served for many months as Chief of Field Service, Ordnance Department. His task has been to get all ordnance materiel from the point of manufacture to the point of use by troops, to maintain and repair ordnance in the theaters of operation, and to salvage unrepairable and obsolete equipment. He was promoted to Major General in December.

Brigadier General C. M. Easley, USA, assistant commander of the 96th Division (which *should* be a rifle-shooting outfit!), was the first general officer wounded on Leyte, Philippine Islands, being hit in the right arm by a Jap sniper on November fourth. The sniper was killed by General Easley's Aide, Lieutenant Leslie Parish of Dallas, Texas. Major C. M. Easley, Jr., son of the general, is also on duty on Leyte.

Brigadier General M. A. Edson, USMC, leader of the original Marine Raiders, outstanding troop commander at Tulagi and Guadalcanal, Chief of Staff of the 2nd Marine Division at Tarawa, now occupies one of the top positions on the staff in the Central Pacific.

Colonel Orin L. Wheeler, USMC, has been awarded the Distinguished Service Medal for operations on Tinian.

Commander Thurman Randle, USNR, NRA President, turned over the Navy range at Newport, Rhode Island, to Lieutenant Ray Whitaker, USNR, NRA executive committeeman from Tulsa, Oklahoma, some months ago and came to Navy Headquarters in Washington, to assume direction of all Navy rifle instruction. Randle was promoted to Commander a few days before Christmas.

Lieutenant George W. Spurlin, USNR, of Dallas, made a forced landing in the Mediterranean in November, suffering chest injuries and spending six days on a rubber raft with his two crew members before being picked up by an Allied patrol boat. He was hospitalized in Naples. At last accounts he was well on the road to recovery.

Lieutenant Lester Jeffrey, USNR, was one of the original crew of NRA members commissioned by the Navy to institute its small-arms training program at Newport, Rhode Island. It was Chief Gunner Jeffrey at that time. In December he was commissioned a full lieutenant, USNR, and dispatched to "duty beyond the seas" of great importance to the future conduct of the war. The assignment will take full advantage of Jeff's expert ability as a long-range shot and coach.

Lieutenant Tom Child, Combat Engineers, USA, NRA staff member, took over command of the Headquarters Company of his battalion when his company commander was knocked out during the invasion of Guam by the 77th Division. Later Tom went ashore on Leyte commanding "C" Company of his outfit.

Private First Class Emerson Parker, USA, machine gunner and youngest son of Lieutenant Colonel Francis W. Parker, Jr., NRA Vice-President and Director of Training, Contract Settlement and Renegotiation Section, Army Service Forces, was reported missing in action in the European Theater of Operations.

War Correspondent Bill Shadel, NRA staff man, may be heard over CBS radio stations in front-line news reports from Luxembourg. Stories by Shadel slanted to shooters will appear from time to time in THE RIFLEMAN.

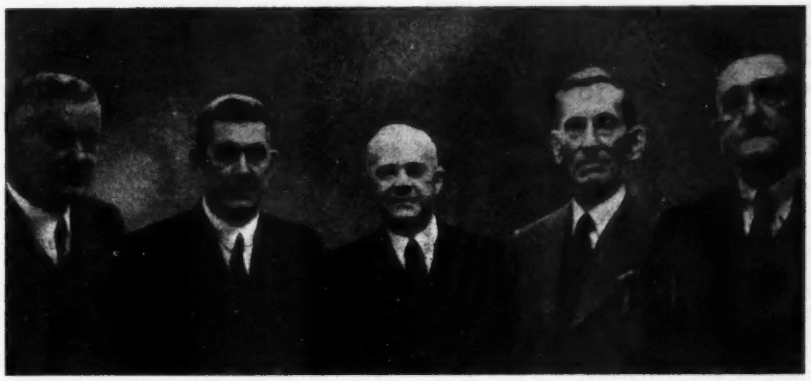
Lieutenant R. A. ("Dick") Barr turns up in a hospital in Britain with four "firsts" to his credit, insofar as NRA headquarters employees are concerned. Dick was the first NRA man to have been (1) wounded, (2) taken prisoner, (3) rescued, (4) wantonly shot by the Germans while a prisoner and already wounded.

It all happened when Dick's forward O. P. was over-run during the early days of the German advance in the Ardennes. The German platoon, wearing American uniforms, approached close to the O. P. before Lieutenant Barr was sufficiently certain of their identity to give his men word to open fire. After the fight started, the Americans accounted for a baker's dozen of the Jerries but a German bullet caught Dick on the front of his helmet, went through, creased his scalp, and passed out the back of the helmet. He was knocked out and his men surrendered. The German patrol passed on leaving their American prisoners lying in the snow under one Nazi guard. Shortly afterward a platoon from Barr's outfit drove back the German patrol which abandoned its prisoners to their rescuing friends but only after putting another shot through Dick's back as he lay unconscious in the snow. (And there are still Americans who want a soft peace for the poor Germans!)

FIRST CHOICE

To Clubs interested in increasing their memberships and to communities sufficiently awake to postwar problems to be looking forward now to the needs of returning servicemen, the following item of news from the newspaper, *Army Times,* should be of interest:

Soldiers of the 41st Division in the Southwest Pacific were polled on this question: "What single piece of GI equipment you have used in this theater would you want to purchase for civilian use?" Their answers were conclusive. They chose—the Garand rifle.



Left to right: **L. L. Phipson, S. V. Samuelson, General Thomas Holcomb, C. Godbeer, and Carl Laatz.**

GENERAL HOLCOMB STILL A RIFLEMAN

Forty-one years ago an American rifle team went to Bisley, England, to compete in the largest Palma Trophy Match ever fired. A young Marine lieutenant, T. Holcomb, was the only Regular on the team, all other team members being National Guardsmen or civilians. (At that period in American history it was the civilian rifleman and "militiaman" who, through their National Rifle Association, were teaching the Army and Marines the rudiments of small-arms marksmanship!) The Americans won the Palma that year at Bisley and a team of British "Colonials" from Natal finished in sixth place.

A few months ago General Thomas Holcomb, United States Marine Corps, retired as Commandant of the Corps which he had helped build into one of the most deadly efficient shooting organizations in the world. He was appointed United States Minister to the Union of South Africa—which is great shooting country. "Tommy" remembered the Palma of 1903 and the friends he had made at Bisley from among the riflemen of Natal. So the United States Minister inserted an advertisement in the papers of Natal inviting surviving members of the 1903 team to be his guests at dinner in Durban. Four of them responded, the only four survivors. One of them, Mr. C. Godbeer, seventy-four years of age, was hospitalized because of a serious operation, but he left the hospital long enough to attend the "Palma Dinner." The other three riflemen who renewed long interrupted acquaintances were S. V. Samuelson, C. Laatz and L. L. Phipson. There is evidence that the South Africans, who love a good sportsman and admire a good shot, are already on their way to placing "Tommy" Holcomb in the same kind of niche of affectionate regard and admiration that he has so long occupied in the hearts and minds of American riflemen—Regulars, National Guardsmen, and civilians alike.

THANKS, SOLDIER!

From the December 14th issue of *The Crutch,* mimeographed newspaper published by the Reconditioning and Training Section of the Regional Hospital, Camp Barkeley, Texas, comes the following tribute—from men whose praise is doubly golden in view of the sacrifices they have made for us:

"For years to come, after the cessation of hostilities, poets and writers will extol praise for the unsung heroes of this war. . . . Another 'good soldier' of this war is the National Rifle Association. Few people know of or appreciate the worthwhile program this organization has conducted the past few years by instructing young men of pre-induction age in the basic principles of rifle marksmanship in the many schools of small-arms firing maintained by rifle clubs under the supervision of this parent organization. . . . The percentage of men who had never even held a rifle in their hands was alarmingly high. Realizing this deficiency, the NRA shouldered the responsibility of giving Basic Rifle Training to all men desiring it, and the number of inductees so trained now is in the thousands. Their 'scores' on the field of battle bear witness to the value of that training! . . . The NRA has truly been 'A GOOD SOLDIER'!"

ANNOUNCEMENT

"On July 1, 1944, the Associated Rifle and Pistol Clubs of Baltimore, Inc., was granted a charter by the State of Maryland to operate as a nonprofit organization for the promotion of rifle and pistol practice and for training United States citizens in our community in the proper care and handling and use of firearms.

"Each club in affiliation with our association is required to establish as a Class A, NRA affiliated club and each club upon affiliation with the Associated Rifle and Pistol Club elects two of its members to serve for a period of two years as active voting members and trustees of the Associated Rifle and Pistol Clubs.

"In making this announcement we wish to send an invitation to all clubs in our area with Class A standing to affiliate themselves with our Association and we invite inquiries which may be addressed to the Secretary, Cornelius J. Rassa, 3013 Echoldale Avenue, Baltimore 14, Maryland, or to John G. Lenz, President, 3216 Batavia Avenue, Baltimore 14, Maryland.

CHALLENGE

The Storm King School, Cornwall-on-Hudson, New York, would like to shoot postal matches with other college preparatory schools. Write J. H. Smith, Jr., Sergeant-at-arms.

BOOK REVIEW:

"HAND CANNON TO AUTOMATIC"

By HERSCHEL C. LOGAN

This volume is subtitled "A Pictorial Parade of Hand Arms". It is an apt description. In any parade we expect to find the colorful, the eye-catching, the unusual. We watch parades primarily to be entertained, not to be educated. So it is with this nicely bound, attractively printed, carefully illustrated picture book of pistols and revolvers. Anyone who is enough interested in guns to read THE AMERICAN RIFLEMAN will find "Hand Cannon to Automatic" a most entertaining companion for an hour or two. The amateur collector will devour it. The experienced collector and historian will brush it aside. The average shooter will like it on the library table to entertain his nontechnical friends.

The clear line cuts depict a great variety of odd and unusual pistols—"palm pistols," knife pistols, cane pistols, turret pistols, flint and pill-lock revolvers, etc.—most of which were not practical enough to capture popular fancy or to get into quantity production. Unfortunately, however, practically no details are given, in drawing or type, as to the mechanical working arrangements of these novelties or of the standard arms of real historical interest—the arms which formed the foundation on which we progressed from the slow-matched hand cannon to the semiautomatic. Mr. Logan has faithfully portrayed these basic types of weapons which form the family tree of modern arms but there is nothing in their treatment to set them apart from the mere oddities which occupy most of the pages in the book.

If you are a collector of gun oddities, this book is a "must" for you. Otherwise you can take it or leave it, dependent on the seriousness with which you view $5.00.—C. B. L.

(196 pages, cloth, 8 x 10½ inches, 172 line cuts, price $5.00. Standard Publications, Huntington, W. Va. For sale through NRA Book Department.)

REPORT NEXT MONTH

Highlights of the Secretary-Treasurer's annual report to the NRA Board of Directors, together with a report of the Proceedings of the Directors' and Executive Committee's Annual Business Meetings, to be held in Washington, D. C., February 2nd and 3rd, will be published in March. Acceptances already received indicate that more than half of the Association's sixty Directors will attend the Board Meeting on February 2nd.

BUFFALO CLUB REPORTS

W. H. Eggert, newly elected vice-president of the Buffalo (N. Y.) R. & R. Club, dropped in at NRA Headquarters recently to discuss shooting activities in the Buffalo metropolis. We were particularly pleased to learn about that club's plans to construct its own clubhouse and indoor range as well as to foster a junior rifle club. The Buffalo Club sponsors a women's division which, incidentally, held a very successful Kicker's Handicap Merchandise Shoot for pistol shooters on January 14th.

IS THIS YOUR GUN?

Life Member Raymond T. Roush writes: "Over two years ago I sent a rifle to Mr. C. W. (Jack) Frost, who operated as The Humboldt Arms Company, Arcata, California, for restocking. Investigation begun upon his failure to return the rifle finally located Mr. Frost at or near Twin Falls, Idaho. Mr. J. H. Blandford, attorney in Twin Falls, forced a settlement, in the course of which Mr. Frost produced a rifle—a Winchester Model 70 with Magnum action, 7 mm. or .270 caliber—which was sent to me as mine.

"This rifle is not mine. Mr. Frost has now paid in cash the amount of my loss and, if the real owner of the above rifle will write to me, care Tri-State College, Angola, Indiana, identifying the piece by serial number or otherwise, I'll pack and ship it by express collect.

"Also, other members who may have lost rifles sent to Mr. Frost might secure assistance, as I did, through Attorney Blandford."

STOLEN GUNS

One .22 caliber Colt Woodsman Target Model with 6½-inch barrel. Serial Number 88763. Paul Hazen, Bendix Rifle and Pistol Team, Route 1, Osceola, Indiana.

One 3½-inch DWM new model .30 Luger, "geladen," Number 1456. Ralph G. Spence, 1523 Michigan Ave., Hammond, Indiana.

One Parker G. H. Double, 20 gauge, single trigger, white tenite comb on stock, Serial Number 239414. Fifty dollar reward for information. Francis Raring, 403 W. Market Street, Pottsville, Pa.

One Colt Official Police Revolver, Number 566,712, blued, 5-inch barrel, Walnut colored tenite grip adapter stocks. Walter C. Heisler, 304 North Canyon Blvd., Monrovia, California.

One New Service Colt revolver, caliber .45 auto., Army number 46,106. M/Sgt. F. A. Turner, Post Office HAAF, Hobbs, New Mexico.

COMING EVENTS

Class C Registered Tournaments

Arizona, February 18—Small Bore Tournament, Phoenix. Howard Johnson, 936 E. Van Buren, Phoenix, Arizona.

California, February 9—Gallery Pistol Tournament, Alto. H. O. Peters, 706 3rd Street, San Rafael.

February 18—San Francisco Police Department Monthly Pistol Tournament. E. J. Dutil, 324 16th Avenue, San Francisco.

March 9—Gallery Pistol Tournament, Alto. H. O. Peters, 706 3rd Street, San Rafael.

March 18—San Francisco Police Department Monthly Pistol Tournament, San Francisco. E. J. Dutil, 324 16th Avenue, San Francisco.

Unregistered

New York, February 18—Annual Metropolitan Rifle Championship, New York City. Austin Huffman, Valley Cottage, New York.

12th season Central New York Pistol League; continuous match, ends March 31st. Fred A. Hodges, 1311 Oak Street, Utica.

Pennsylvania, February 17-18—2nd Annual Indoor Small Bore Rifle Match, Llanerch. Simon A. Oster, 2800 Township Line, Llanerch.

THIS CITIZEN WAS ARMED

THE OREGONIAN, Dec. 5, 1944.—One ex-convict was killed and a second was seriously wounded when a Portland business man shot it out with them rather than submit to a holdup.

W. E. Bennett, former inmate of Oregon State Prison and holder of a long Portland police record, was killed. George Fredericks, who served a robbery sentence in Washington State Prison and who has a police record here and in San Francisco, was wounded.

The two men were shot by Joe Mazzina, forty-seven, proprietor of a tavern here. Mazzina told detectives that he came home at midnight and found two men attempting to open the door of the apartment house where he lives. One of the men drew a gun, saying, "This is a holdup."

Mazzina ran out of the doorway and down the street. He said the man with the gun stepped out of the doorway and began shooting at him. Although wounded, Mazzina drew his own gun and fired several shots in return. His first bullet struck Bennett in the chest. As Bennett fell, the second of Mazzina's shots struck him in the temple. Mazzina's third shot struck Fredericks in the leg, ending the battle.

Mazzina was rushed to a hospital where attendants found his condition "not critical."

OPA LIFTS CEILING

New maximum prices for rifles and shotguns have been fixed by the OPA, effective January 22, 1945. Manufacturers' maximum prices to distributors are fixed at no more than the January, 1942, price plus 8 per cent for rifles, 9 per cent for shotguns. Distributors and retailers are allowed an increase of 5.35 per cent and 2.2 per cent, respectively, for rifles; 6.54 per cent and 3.7 per cent, for shotguns.

William G. Nicholson

He was known only as "Nick" to several thousand NRA members and National Match competitors. But as "Nick" he was undoubtedly one of the most *widely* known of the workmen who have done the clerical work, the packing and shipping, the cleaning and polishing, the scoring, and all the other work-a-day tasks that have enabled the NRA to become a great national organization.

Nick was born March 2, 1894, at St. Johnsbury, Vermont. He joined the Maine National Guard while working in that State and went overseas with the Yankee Division in World War I. After the war he re-enlisted in the Regular Army and made his first contact with the NRA and the National Matches when he was assigned as a sergeant to do clerical duty in the office of the National Board for Promotion of Rifle Practice in 1923. When his enlistment expired he was employed by the NRA and continued with the Association until 1938. After three years with the American Red Cross Nick re-entered the Government service soon after war was declared, serving this time as a civilian employee of the Army Service Forces. He entered the U. S. Veterans Hospital at Mt. Alto, D. C., in February and died October 10th. He was buried in Arlington National Cemetery. He is survived by his wife and by two sons both in the Armed Services.—C. B. L.

DOPE BAG ☆ ☆ ☆ Conducted by F. C. NESS

THIS MONTH:

Carbine Makes Better Pistol · The .300 Magnum on Antelope and Varmints · The PMVF on Elk and Targets · A Fine Vard PMVF Magnum · Making R.C.B.S. Bullets on Pacific Reloaders · Letters · Trade Dope

M1 CARBINE PISTOL

Out in the Pacific, Lt. Col. A. M. Murray had the unique experience of capturing one of our M1 .30-caliber carbines from a Jap who was using it on him. At home, the Colonel had had some success on jackrabbits with his .357 S. & W. Magnum, and this inspired him to remodel the carbine into a handgun. He did, and found it superior to the revolver, at least in the Pacific application. His V-Mail from the Pacific Front gives some sketchy particulars of his conversion job.

He cut the barrel off within two inches of the gas port, and shortened the plunger housing to 1¼ inches in order to lighten the muzzle, leaving off all wood except the short section needed for a handle. For a front grip on the heavy gun he welded one to the bottom of the trigger group, making it a small two-hand submachine gun. He moved the front sight back and made a rear sight of a flat spring, slipped into the regular base.

The penetration was apparently that of the standard carbine when he tried it, and his 25-yard groups measured three inches. In one test he sank an oil drum, with only five shots, at 150 yards. After carrying it through three fights he felt much more satisfied with it than with his .45 handgun formerly carried. The conclusion he reached was that it makes a better pistol than a rifle.

BELTED .300 MAGNUM AND PMVF

Wilber Gallinger tried the Western 180-grain O.P. Magnum load on Alberta antelope at 200 yards, and it wrecked the entire front quarters. He tried the W. T. & C. W. 120-grain and 64 grains of No. 3031 on a coyote at 300 yards, and it blew the entire offside off the animal. Now he is looking for something more economical. Elwood Epps has been trying 60 grains of No. 4064 behind a 165-grain .30-30 bullet with good accuracy. That is the load E. Baden Powell reported to be effective at long range on California deer with a hollow-point M1 bullet in the .300 PMVF. The others above were the .300 H. & H. Magnum, of course.

Joseph J. Bugiada, of Brooklyn, and his friend, use the .300 Magnum Bullgun, Model 70, and 180-grain Silver Tip ammunition for their long-range chuck shots. Joe's Magnum has the 15-X Lyman on it, and his longest kill is 450 yards, but his gun, in the hands of his chum, killed one at 700 yards near Rhinebeck, New York, last September. Gene Berg shot from rest with an elevation, on the scope, for 900 yards, according to the elevation tables. A lot of shots were misses, spotted by the big B. & L. 65 mm scope, by both shooters, before Gene connected.

E. C. Boswell, of Akron, Ohio, used 75 grains of No. 4350 behind the M1 bullet to sight in his new .300 PMVF at 75 yards. Then he added five grains powder and hit a rock wall on the point of aim 600 yards distant. On account of recoil he cut his loads to the original, and also used 70 grains of No. 4320 behind the same 172-grain bullet. These loads pulverized the tough Service Boattail, in the ground, at 125 yards. The best five-shot group at that range was 2⅝ inches, my measurement. At 50 feet it perforated ⅝-inch cast steel breaking out the back as far as two inches from the bullet hole. These preliminary loads were prepared without proper tools. In fact, Boswell is still waiting for R. W. Miller to send his sizing dies after being handicapped, for more than a year, by Miller's delay.

I sent my own .300 Magnum Bullgun to Vard, Inc., last year, together with my Schmitt dies, but the firm went out of the gun business, without advising me to date. I understand this job and another of mine have been turned over to the Hollywood Gun Shop, but they also have failed to advise me. Jack Frost, of The Humboldt Bowmen, has had my fine custom 1917 rifle for several years and refuses to write. J. B. Sweaney has held my .220 Swift rifle since 1934, over ten years, and merely sends regards and greetings; even that little, but rarely. I just don't understand these gunsmiths!

Lt. A. M. Learned was more fortunate when he got a Model 70 Target in .300 PMVF from Vard, Inc., last year, with 100 reformed cases and a set of "beautifully machined" dies. He used 78 grains No. 4350 behind the 180-grain Silver Tip and M1 bullets with the W.R.A. No. 120 primer, and also 80 grains of this powder behind the 150-grain M2 bullet. These all give better than two-minute accuracy, or about 1½ inches at 100 yards. When its load was cut to 75 grains, the M2 bullet gave the same impact as the M1 load. His midrange load lands six inches lower than these, but gives finer accuracy, down to ¾-inch groups. This is the M2 bullet and 40 grains of No. 4198, settled back against the primer, although 35 grains gives equally fine accuracy. It prints its groups 1¼ inches lower than 40 grains. His grouse load, in this big case, is only 6 grains of Bullseye behind the Ideal lead-alloy bullet No. 308291, which lands 2 inches low at 50 feet and requires at least 10 minutes elevation for use at 50 yards, where it groups into 1¼ inches. These practical loads make Lt. Learned's .300 PMVF quite versatile, as all of them land on the same vertical line and require no azimuth allowance or adjustment. He is looking forward to the end of the war and opportunity of using it on the Olympic Peninsula of Washington, his home hunting ground.

Just in time to catch this issue of the Dope Bag, I got word, from E. Baden Powell, that Vard Inc. are planning the manufacture of Controlled Combustion Chambrage rifles and are licensing the CCC and PMVF work to selected gunsmith shops, with patents applied for. One prominent shop included in these very few is the Hollywood Gun Shop which has been preparing for active operation, beginning this month. Regarding his .300 PMVF, Powell said among a variety of big game his two personal rifles loaned to hunters accounted for seven elk at ranges longer than 700 yards and one nearer than that, besides mule deer and one moose. He further stated that with the powder load cut to 58 grains of No. 4064 behind the 180-grain bullet, the velocity of the .300 H. & H. Magnum Match load is duplicated. This load has given him "minute" groups in properly rebedded Model 70 rifles while 25 grains of No. 4759 behind the same bullet gives only half that much spread. This bears out Lt. Learned's report and indicates that the Powell-Vard workmanship was O.K. while it lasted.

For hitting at long range in windy weather and for adequate penetration in heavy game, sectional density is important, and it offers a succinct comparison of big-game bullets for the Magnums and similar rifles. The M1 bullet has an S.D. of .259 which equals the .258 of the 300-grain bullet in .407 caliber. The 180-grain has a little higher figure, or .270, but the 220-grain .30-caliber bullet has an S.D. of .330, which is superior to the .325 of the 250-grain bullet in .333 caliber. The 300-grain bullet of the .375 Magnum has an S.D. of .311, identical with that of a 272-grain bullet in .350 caliber. The .505 caliber is about the limit and its S.D. of .417 is about tops, but that requires a 745-grain bullet.

A YEAR WITH R.C.B.S.

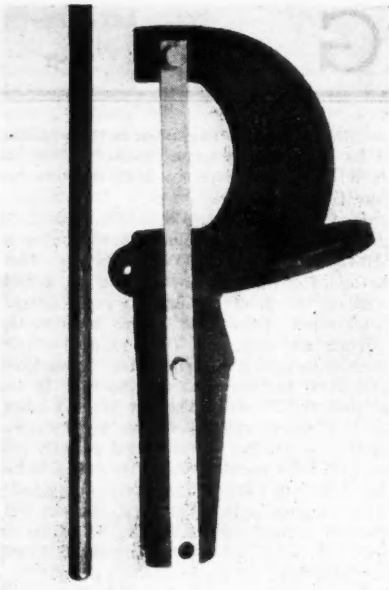
I have now had a year's experience in making bullets with R.C.B.S. equipment and have developed some of my earlier opinions into conclusions. These concern the tools, the technique of operation, and the methods of preparing the bullet material. I have proved, to my own satisfaction at least, that finely accurate bullets in .22 caliber (.223 to .228 inch) can be made, from lead wire and fired .22 rim-fire cases, with this equipment in the Pacific Reloader. While this holds true for all such bullets I have made in .224-inch and .226-inch diameter and in all weights from 45-grain short bullets to long 65-grain bullets, it does not hold true for any bullets that are quickly, conveniently, and easily made with light pressure. Besides the symmetrical alignment of head and body that is assured by properly made and fitted tool parts, good accurate bullets must have smooth unwrinkled contours and a uniform density that is assured only by adequate swaging pressure. One of my conclusions is that the Pacific Reloader, good as it is, is too weak in design and material to long withstand this essential swaging pressure, even when it and excess friction are modified by proper anneal and lubrication.

The maximum job for which the Pacific Reloader was designed is full-length resizing of

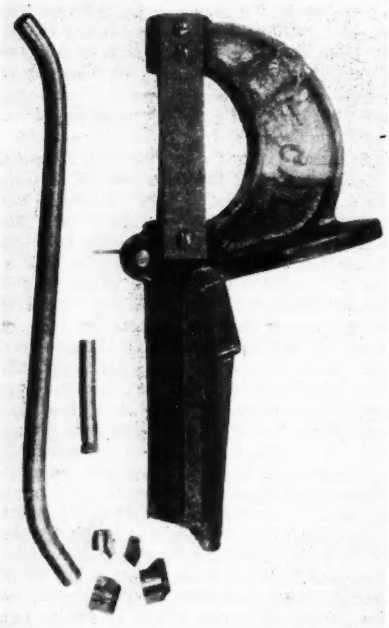
cartridge cases. It is strong enough for that, and it is a deservedly popular reloading tool, but it is not strong enough for bullet swaging. The hook-form frame is a casting, and it breaks in the curve behind the die holder at the top. When ours broke there, we had it welded and then we reinforced it with strap iron. It then held until it broke at the bottom where it is pierced for the main pivot, or base pin, as shown in the cut. It was then replaced by a new Pacific Reloader properly reinforced by Fred T. Huntington. This better method is shown in the other cut. Although the frame itself was better supported, the base pin became bent and the inner link pins broke. This would indicate that even the action parts of this tool are not strong enough for the job of swaging jacketed bullets. However, it is so popular that it is universally misused for this bullet-making purpose, and it is more than probable that the makers will place a stronger model on the market as soon as the war and the economic situation will permit. It is to be hoped that they will do this.

After all these months, I am still experimenting with cleaning methods, but I believe the quickest way of initially removing the grime and grease that adheres to fired cases is to shake them in a can, or jar, of some volatile solvent and then let them dry until the time of boiling in soapy water. Zoric Cleaner, Naphtha, gasoline, and similar solvents have been used for this purpose. After boiling, they are deheaded while wet and the soap helps them slip through the die. Then they are dried by annealing, in the kitchen oven, a minimum of an hour at 450 degrees F. and a maximum of 650 degrees for half that time. After maximum annealing, they turn black and must either be brightened in a 10 per cent acid solution for not over five minutes, or dry powdered graphite must be used to cut down excess friction in swaging. When the cores are melted in, no preliminary annealing is necessary. I use both methods but prefer the first anneal, as it dries the hulls and also cracks loose any remaining residue of primer or dirt for final removal by the acid treatment. One Sunday, recently, I cleaned, deheaded, and annealed a lot of more than 2000 .22 Long Rifle cases. In large lots, like this, I leave the different makes mixed and segregate them only when I put in the cores.

Deheading is the easiest operation if done while the cases are wet and slick with soap. I seat the die short and let the air, trapped between the two cases, pop the topmost from the die, to a pad on my bench, for later collection in quantity. They go through at the overall rate of ten per minute. For .226-inch bullets, of heavy weight, I make the hulls that diameter and I prefer a .196-inch core. For smaller bullets, I use a .222-inch die and 3/16 lead wire. For 65-grain bullets, the slender core must be too long for the hull, and it is melted in, or preswaged, with difficulty, or with a loss of uniformity. The wire I obtained from Fred Huntington was very uniform in diameter, but the fifty pounds I bought in Baltimore varies considerably, and I have to segregate the cut cores into light, medium, and heavy lots, by weighing each one. Thus, when I cut 65-grain cores, I also get them as heavy as 68 grains and as light as 63 grains. This sorting is fast, on the Pacific scale, as a variation under two grains does not seriously affect the accuracy of fairly heavy bullets. For the shorter cores of lighter bullets the variation is less, and my three-lot segregation adequately takes care of it, as our satisfactory target groups indicate.



New Pacific Reloader properly reinforced by Huntington with heavy full-length steel strap. Bullets illustrated and many others were made on this frame with homemade handle as shown.



Old Pacific Reloader after making R.C.B.S. bullets. Note bent base pin and handle, welded break and reinforcing strap at the top, and the broken casting at the bottom pin hole.

When the deheaded hull is dipped full of molten lead, or when the lead wire is melted in it, the chores of annealing and of preswaging are eliminated. With a punch and mallet I can preswage 200 cores per hour. With the R.C.B.S. blank head I can do half that many. With the long cores required for 65-grain bullets my production drops to one per minute. In melting these long cores, their projecting tops slop over the mouths of the hulls. The ideal way would be to use heavier (.220-inch) lead wire for these heavy weights, perhaps, or to dip them full of molten lead, but I have not tried either of these expedients.

Some lots of cases may not require annealing after deheading, but many of them do, and it is safer to use a mild anneal if accuracy is of any consequence. Some lots gave fine accuracy only after they had been given maximum anneal. I over-annealed one soft lot and the bases ruptured and leaked a little lead during swaging. However, even these leaked bullets grouped surprisingly well, because they were properly made in all other respects. With 36 grains of No. 4320 in the Gebby Varminter, one flier enlarged the group to 1.14 inches, and all the others were in ¾ inch. Five were selected and all grouped into .87 inch.

The acid treatment, after annealing, does more than brighten the hull. It also helps remove any interior residue cracked by deheading or loosened by annealing. We take nine parts water in a glass jar and pour into it one part hydrochloric acid. Do not pour the water into the acid as the container might break. Unless the slight scale and carbon deposit from maximum annealing is removed, it will be necessary to use a lubricant on the hulls. Dry soap or powdered graphite can be used. Any oil or grease picks up grit and soon scores the polished interior of the die. Waldemar Doering melts in his cores and then uses graphite on the annealed jackets in swaging his bullets, which are the only R.C.B.S. bullets that we have found equal, in flat-base type, to our own. To date, his cavity-base has not shown equal accuracy, and these do not equal those that I make of this type. A more nearly perfect fit and alignment of the base plunger is necessary in making good hollow-base bullets, and the technique of operation is more critical. This applies to R.C.B.S. swaging.

In swaging, the important thing is to have a head die which matches the body so that the two are concentric and in perfect alignment or you will have an unbalanced bullet no matter how well it is made otherwise. This is as important as the proper adjustment for and application of a uniform swaging pressure, and the R.C.B.S. dies are so furnished in matched sets. When the operator has available spare heads of different types from different matched sets of R.C.B.S. dies and mixes them he must determine experimentally whether they match adequately if he wants to make accurate bullets. This is done by using a little excess pressure at first to leave a pressure ring around the bullet and then noting whether it is uniform all around with the head portion of the bullet in perfect alignment with the cylindrical base portion. Even with slighter, normal pressures the same thing can be determined by examination under a low-power glass and it

should be done in order to insure such necessary concentricity.

It is equally important to have the base plunger in perfect alignment, and a good snug fit in the die, or the bullets will be inaccurate from imperfect, or off-angle, bases. This latter requirement is particularly important when hollow-base bullets are made, and the pointed hollow-base plunger must accurately contact the exact center of the base or it will be impossible to make accurate bullets of that type. The only way of insuring this is to preform bullets with the flat-base plunger and then run them a second time with the hollow-base plunger. In doing this, the best method is to incompletely close the nose the first time and finish forming it only during the second run with the hollow-base plunger. This will save time and help make better bullets more easily.

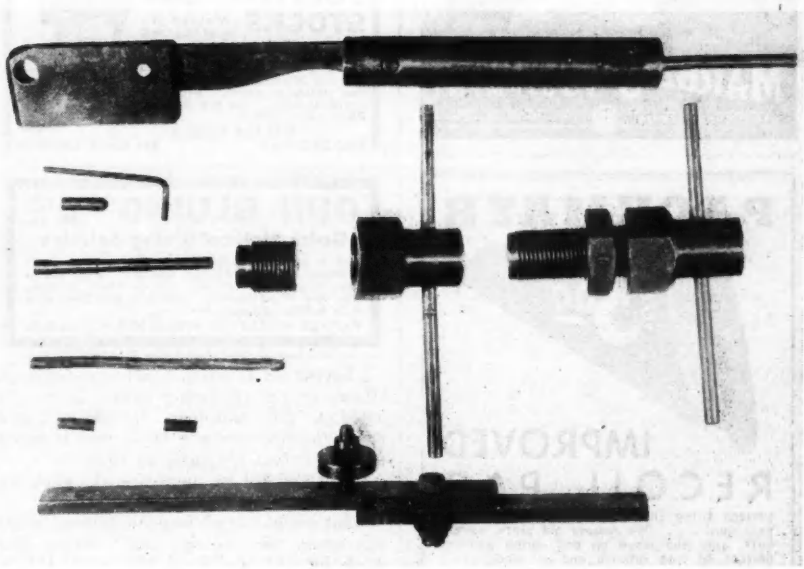
Another thing about hollow-base bullets is that they must be of a suitable design in addition to being accurately made or they will be very sensitive to loads in a given gun, in the matter of the relationship between initial velocity and rate of rifling twist. I have made some very accurate hollow-base bullets with R.C.B.S. equipment among many different experimental designs of that type. In general, I believe that a longer body or a blunter nose is better for the hollow-base form rather than short bodies and long, pointed noses.

In swaging some bullets the technique, or the application of pressure, is as important as is the amount. In fact, too much pressure is as bad as too little, and it must be modified when it develops a pronounced pressure ring around the bullet or fins at the base edge. With barely enough pressure, hard, unannealed hulls may fold and wrinkle along the ogive, back of the point, but careful, slow application of the same amount of pressure, in steps, or by degrees, will properly fill those same hulls. With soft or well annealed hulls and the maximum allowable pressure the bullet can be deliberately made more dense by proper application or technique. To make the copper flow back and form a shorter bullet of the same weight, I release the trapped air twice, tighten the joint the second time, and hold the pressure for three seconds to let the metal flow. It must be given time. That is why my rate of production varies with the type and nature of the bullet, or from sixty to 125 per hour of good accurate bullets. Poor bullets, indifferently formed, can be made much faster, but the time spent is utterly wasted, in my opinion. These short, thick-jacket bullets are very tough in the 49-grain weight as I make them. In the K-Hornet and 2R Lovell they are good only for fine paper accuracy or for light game. Even at maximum velocity, in the Varminter and Swift, they go entirely through a woodchuck without expanding appreciably.

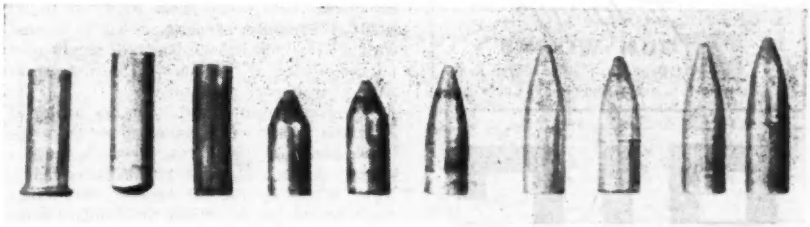
In the bullet picture, from left to right, the .22 Long Rifle case weighs 9½ grains, as it does in deheaded form, and the core weighs 53 grains. The first two blunt-nose bullets weigh about 46 grains, the flat-base being shorter than the hollow-base. These are made from .22 Short cases, all the others being of the .22 Long Rifle. The third bullet (flat base) and the fifth bullet (hollow base) weigh 49 grains each, and all four have the same core of about 39 grains. The fourth and sixth bullets weigh 58 grains, although one has less lead exposed with the same core. The last bullet weighs 65 grains and has a .226-inch head, for groove diameters up to .228 inch. This two-diameter bullet shoots as well as those I make in a .226-inch die, single diameter. All those shown are .224-inch bullets, and the last four long ones were made in the same die.

Doering's well-known, 60-grain, R.C.B.S. bullet weighs only 57 grains on our Brown & Sharpe scale, or 1½ grains less than my own bullet. In a recent shooting test his 57-D and my 58.5-N bullets outshot all others, including the Sisk Express which, however, came close. Full loads were used in three rifles which, normally, do better at longer range. In one bracket, the 55-Express put five in 1.12 inches; the 57-D, five in .90 inch; and the 58.5-N, five in .97 inch, and nine in 1.05 inch. In the Gebby Varminter the 57-D put five in .95 inch, and the 58.5-N, five in .87 inch. In the Lovell .22-.250 the 55-Niedner put eight in .84 inch, and the 58.5-N, eight in .88 inch. In a side test with a different load the 57-D put 80 per cent in 1.74 inches, and my .226-inch 55-grain put 80 per cent in 1.34 inches. In the ten-shot groups we had a few fliers with all bullets. The 58.5-N had one enlarge a group to 1.44 inches, and two enlarged another group to 1.32 inches. The 55-Niedner had two enlarge its group to 1.62 inches. Only five-shot groups were made with Doering bullets, but in the 80 per cent test his fifth bullet enlarged the group to 2.30 inches, while my .226-inch 55-grain made a total group of 2.14 inches.

The R.C.B.S. equipment has never been pictured anywhere, and I am showing it for the very first time here. I can appreciate Fred Huntington's reluctance about showing the parts in detail, although I do so without identifying them as to purpose. The natural first impression is that they can be easily copied. Any toolmaker and many machinists will believe they can do so. However, those who have tried it, from the tools, have finally given up or come to Huntington for a properly made set, because there is a trick involved that originally required several months' solution before accurate bullets resulted. With some justice, Huntington fears that improper matching, alignment, and fitting in the copies attempted will result in poor bullets that may reflect against the genuine R.C.B.S. equipment.



R.C.B.S. equipment for making jacketed bullets. Top: Ram for Pacific Reloader. Bottom: Core Cutter. Middle: Tools and dies for deheading and swaging cases and for preswaging the cores.



.22 Long Rifle case, deheaded hull, lead core, and R.C.B.S. Bullets made by Ness (see text).

SIGHTING DOPE

I am a fairly new member of the National Rifle Association and I do not know whether or not you answer questions such as the following, but thought I would take a chance.

I have a Model G 99 .300 Savage with a Redfield receiver sight. The elevation indicator is graduated 5 marks to the quarter inch. The distance between sights is 27½ inches.

May the Day Come Soon

—when our Forests and Fields shall hear the tread of peaceful steps, and our Rivers and Lakes shall feel the quiet dip of the oars as American youth returns victorious to enjoy again the freedom of the great outdoors, and Marble's Outing Equipment.

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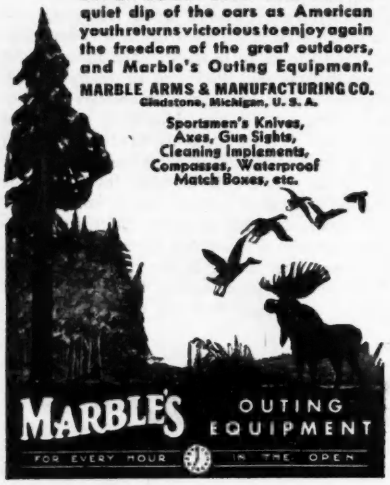

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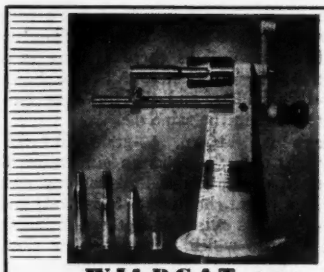

WILDCAT-ers

Illustration shows our new Neck Cut-Off tool, with .06 case; .06 re-sized to .300 Sav. with neck, and with neck removed by the above Cut-Off tool. Is adjustable for length of cut-off, and handles .22, .25, and .30 Cals.
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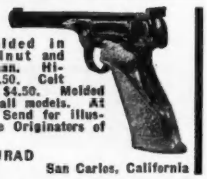

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I have it set to strike 2 inches above point of aim at 100 yds. using 180-gr. bullets. I tested it lately and found it O.K. Then I raised the indicator one mark, and it raised point of impact 4⅝ inches at 70 yards.

Could you tell me approximately what the results should be at 100, 150, 200 yds.?

What would you advise as to distance before you would raise the sight any? About how much for each additional 100 yds.?—H.L.N.

Answer: I have your letter of October 18 and note what you say about your receiver sight with ¼ inch per 5 marks, or .05 inch per mark. That would mean, with your barrel length, 6.5 minutes of angle per mark, because with a 27½-inch sighting base the length of a minute of angle is .0077 inch. This also checks with your impact as quoted.

You say it went 4 and ⅝ inches higher at 70 yards which would mean more than 9½ inches higher at 150 yards, at which range a minute of angle is about 1½ inches, roughly. Now, in testing the 6.5 minutes determined above and giving the minute the standard value of 1½ inches, the change would be exactly what you found, or 9.75 inches. 6.5 minutes per mark would mean 6.5 inches per 100 yards, or 13 inches at 200 yards. That takes care of your sight and sight adjustment.

Now, with any sight, considering the cartridge alone, with the 180-grain bullet, zeroed at 100 yards, it would go about an inch high at 50 yards and 7½ inches low at 200 yards. As you have it 2 inches high at 100 yards it would be only 3½ inches low at 200 yards and nearly on aim at 150 yards.

TRADE DOPE

Gun Re-Blu Company of Tampa, are now pretty well established as "America's Original Gun Bluing House" for those who do not want to invest in tanks and salts for home blueing. Don Gowen informed me in his last letter that his company also does fine gold-plating on small guns, as well as silver plating.

* * *

Chronograph Service. Want your loads tested for velocity? Write R. E. Weatherby, 7672 California Ave., Huntington Park, Cal.

* * *

Robert F. Stryker, Red Bluff, Cal., installs a safety that locks the Springfield bolt.

* * *

Ponderosa Lumber Co., Box 243, San Antonio, Texas, has acquired a line of Mexican sheath knives, with the idea of supplying a once-popular type of trail tool, familiar to old timers of the Southwest. The one we tried was tempered to take and hold a keen edge.

* * *

New Multi-Caliber Bullet Puller has been designed by W. Fasig, 415 Church St., Chula Vista, Calif. This could prove to be an extremely useful gadget. More later.

* * *

Buhmiller-Hooper. J. R. Buhmiller informs me that Kenneth Hooper, a machinist of 20 years' experience, has set up his shop in Eureka, Montana, and does action work, chambering and blueing on Buhmiller barrels under the supervision of J. R. who says customers should write Hooper before sending any work. Buhmiller merely makes the barrel and leaves all the rifle work to gunsmiths.

* * *

Auto-Ordnance Corporation has a new name, now changed to MAGUIRE INDUSTRIES, INC., according to a note from my friend Ted Hayes of both firms, old and new. Ted is Theodore T. Hayes, Vice President.

* * *

Light Gunsmithing. Edwin E. Hite says he can fit pads, refinish stocks, and reblue, but accepts no job without previous arrangement. His address is R.R. 1, Rushville, Ind.

* * *

Martin B. Retting has been discharged from his army duties, and says he is back in the business of selling modern firearms and relics at Shokan, New York.

* * *

Stephen Van Rensselaer, of Morristown, N. J., announces his exhibition and sale of a "notable and extensive" collection of antique firearms, and invites want lists from collectors as no catalogue will be issued. See his ad.

* * *

Agee Custom Shop of Beaumont, Texas, evidently does some fine gun engraving, judging from what I've heard. Finally, I became sufficiently impressed to risk my personal .45 pistol. I'll show a picture of it later.

THE ARMS CHEST

GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. Transactions Based on Good Faith: ARMS CHEST transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics or the attempt to circumvent these general requirements, when brought to our attention, will result in refusal of further advertising and might result in disbarment from the NRA in the case of members.

2. All Orders Subject to These Conditions: WE reserve the right to edit all copy to conform with our standards and to reject or discontinue any advertisement which we consider undesirable.

3. Who May Advertise: The ARMS CHEST is an *open* market trading post. Any individual or firm whose advertisement and methods of doing business meet our requirements may advertise their goods or services.

4. Rates: All classified advertisements must be accompanied by remittance. The rate is 10 cents per word, including name and address—minimum charge $1.50.

5. How to Count Numerals, Etc.: Groups of figures are counted as one word (examples: .30-30, 250-3000, $150.00, $1.50). Abbreviations consisting of initials or single characters likewise are counted as one word (example: W. H. Smith; H.B., meaning heavy barrel; HP., meaning highpower). Hyphenated words are counted as two words (examples: 20-gauge, pearl-handled, no-slip).

6. "For Sale" Ads Must State Price: A specific price must be stated on all FOR SALE ads—exception: a phrase such as "write for catalog" or "details on request" may be used when listing quantities of similar merchandise or real estate.

7. Firearms for Sale or Trade Must Be Defined: The *condition* of every gun (including essential parts) advertised for sale or trade *must* be specified according to *NRA standards*, as follows: PERFECT—meaning factory condition; EXCELLENT—meaning new condition, implying negligible amount of use; VERY GOOD—meaning practically new condition, implying little use, with no appreciable bore wear and only minor surface scratches or wear; GOOD—meaning moderate use with some finish worn off, only moderate bore wear, with no pits and nothing worse than a little roughness in the bore; FAIR—meaning no parts missing necessary to use of gun, reasonable wear inside, and out, nothing worse than minor pits in steel or stock, gun sufficiently accurate for hunting; POOR—meaning marred appearance and pitted or badly worn bore.

8. Non-Specific Phrases Barred: Phrases such as "highest" or "top prices paid", as well as any other so-called "auction-type" phrases are not acceptable. The terms "fair price paid" or "state price wanted" may be used.

9. Blind Ads Not Acceptable: Box number or blind ads will not be accepted. Give your complete name and address, to insure prompt delivery of all mail or telegraph replies.

10. Requesting Privilege of Examination: Purchasers desirous of examining merchandise before acceptance should request shipment by express, C.O.D. with examination privileges. This procedure permits the purchaser to inspect the merchandise *in local express office* and authorizes the express company to return unsatisfactory merchandise at shipper's expense.

11. OPA Ceiling Prices: An agency of the Federal government has legally fixed the prices of various commodities, including individual sales of used firearms and ammunition. Attempts to evade ceiling prices are violations of Federal statutes. It is physically impossible for us to check advertised prices against legal ceiling prices. This is the responsibility of the advertiser, and advertisements offering to buy or sell merchandise at higher than legal prices will, when called to our attention, subject the advertiser to the penalties mentioned in paragraph 1.

12. Federal Explosives Act Defined: Under the Federal Explosives Act of 1941 all buyers, sellers, and possessors of gunpowder (not complete cartridges) must be licensed. Explosives licenses are usually obtainable from county court clerks. Purchasers must submit such license or a certified copy thereof to the seller at time of sale.

13. "Outlawed" Firearms Defined: The sale of certain firearms is outlawed by Federal law unless handled by a Federally licensed dealer. These included machines or submachine guns; sawed-off rifles and shotguns with barrels of 18 inches or less, and Mauser and Luger auto pistols *with holster stocks*.

14. Responsibility for Illegible Copy: Type or print advertisements plainly, as we can not be responsible for errors due to illegible writing. Spell out all descriptive words; avoid abbreviations.

15. Closing Date: The closing date for all advertisements is the 5th of the month preceding month of issue. However, the *volume* of advertising we can publish monthly is limited and the quota is usually filled prior to the closing date. Ads will be accepted in the order received.

FOR SALE

SALE OF SURPLUS GOVERNMENT GOODS. New catalog of antique and modern firearms—Send coin 25¢ Springfield Army rifle slings 1¼" used, fine condition, can furnish any quantity, 75¢ each. Webbing slings 1¼" wide, used good condition, 45¢ each. Whelan oiled rifle slings, 1" brand new $1.50. Whelan rifle slings straps 1¼" brand new $1.75. Swivels 75¢ pr. Springfield sight gauges $1.00. Brass clips for 30-06 cartridges $1.25 per 100. U. S. Army military haversacks, fine condition 60¢. Colt boot hooks for riding boots, 60¢ per pair. 45 automatic pistol holsters, brand new, leather $3.00 each. Brown leather Army Officers' Garrison belts, new, all sizes. $1.65 each. Black leather Sam Browne belts for officers and guards, new, all sizes, $5.95 each. Forward money with order. No c.o.d. shipments. Public Sport Shops, Dept. R-75, 13 So. 16th St., Phila., Penna.

FOR SALE—GOOD NEWS—LIMITED NUMBER custom Hornets and Lovell 2R rifles for Spring delivery, Winchester 52 barrels, $80.00, $25.00 with order. Orders placed as received. Some ammunition available. Paul Ratliff, Hillyard, Washington.

FOR SALE—$1.50 GOVERNMENT USED POCKET compass, great for scouts, fishermen, gunners, cost $5.00. Weil's Curiosity Shop, 12 Strawberry St., Phila. 6, Penna.

FOR SALE—ONE PAIR DUMAURIER PRISM binoculars 10-power, 32mm, like new and leather case, $85.00. One pair binoculars, perfect, Monte Carlo, 8-power, 25mm, and leather case, $65.00. One Winchester 52 Standard barrel, Vaver dial rear, 17A front, perfect, serial No. 65927B, 500 EZX's Long Rifle, price $110.00. Percy Hoffman, 36 S. Fourth Street, Harrisburg, Penna.

FOR SALE—CUSTOM WINCHESTER S.S. 219 Zipper, Malcolm 4X, 60 empties, excellent $135.00. Winchester 54-220 Swift outfit, Super 10X Targetspot, custom case, 100 custom cartridges, excellent $239.00 Nine 12ga. single & double trap guns, $60.00 to $265.00, write for particulars. Mauser Varminter, low bolt & safety, scope bases, sporter stock, sling, 50 cartridges, perfect, $145.00. Colts .22 O.P. 6", hand honed, special grips, 500 cartridges, excellent $56.75. International flare signal gun, excellent $15.00. .45 Colts Ideal tool, dies, mould, 130 cartridges, $12.50. Six Springfield low number, receivers only, no other parts, excellent, $7.50 each. Revere single 8 movie camera, new $24.50. Want—Rifles, shotguns, scopes. Herman Treptow, Milltown, N. J.

FOR SALE—COLTS, NEW SERVICE 45 LONG Colt, 7½" barrel, excellent, $50.00. New Service 45 ACP 5½" front of trigger guard cut away, reblued very good, $45.00. O.M.T. 38 Special, very good in, good out, new stocks, $55.00. Government Model automatic frame reblued over rust pits, rest of gun very good, assembled from parts, #C 19600, $45.00. Camp Perry Model, 10" barrel, excellent, $50.00. C. H. Lawson, 89 Myrtle Avenue, Edgewater, N. J.

FOR SALE—10-GAUGE MAGNUM ITHACA 2 new 4 beavertail forearm and stock new pad single trigger plain ejectors 32 F&F, 13 boxes shells, 2s, 6s, $265.00, new. Parker V HE trap vent 32 F&F, 12-gauge Magnum single auto ejectors selective, $175.00, perfect. VHE Parker 12-gauge, 30 F&M, 2 triggers auto ejectors, $125.00, very good. Fox CE 12-gauge, 32 F&M 3" chambers auto ejectors, perfect, $115.00. Ranger Skeet O&U 12-gauge, 26 barrel M.I.M. perfect, 100 trap shells, $65.00. Mauser 98 8mm carbine with shells, $40.00. Hi-Standard B 22 auto, new, 500 shells, holster, $45.00. Camera size Firestone portable radio AC and battery, $20.00. Assorted shotgun reloading equipment and shells, $10.00 Buck-kin new fringed scout coat, size 46, $28.00 Few duck calls left, $3.75. No C.O.D.'s. WANTED —Griffen Howe .30-'06 Springfield and 63 Winchester .22 auto rifle, .25, .30 and .32 caliber Remington auto rifle. R. A. Larson, Wells, Minnesota.

SPRINGFIELD RECEIVERS RE-HEAT-TREATED $9.00 stripped bolts old style $4.00 complete $7.50, firing pins $1.00, rods $1.00, sleeves $1.50, safes $1.00. Krag stripped bolts $4.00, safes, feeders, strikers $1.00 each. Mauser 98 issue barrels, v.g. bores $4.00, bolt plugs $1.50, Enfield trigger guards stripped $1.50 complete $2.50, magazine boxes, strikers, firing pin nuts, sleeves, safes, floor plates $1.00 each. NEW LIST FREE: Flaigs Hunters Lodge, Millvale, Penna.

WHY YOUR MAGAZINE IS LATE

Please bear with us if your copy of THE RIFLEMAN arrives later than you have been accustomed to receiving it. In normal times the magazine is mailed on a schedule providing for delivery during the first week of the month of issue. We still mail according to a plan designed to effect simultaneous deliveries throughout the United States; but the continuing wartime strain on publishing, postal, and transportation facilities makes it impossible to guarantee normal-uniform deliveries. For example, the December, 1944, issue, mailed December 11-16, inclusive, was further delayed by the heavy pre-Holiday mails, hence many subscribers failed to receive that issue until after Christmas. Only a return to normal conditions can remedy this situation. Meantime, you have our assurance that when your copy arrives late, the same issue is probably being delivered late to all other subscribers. We ask that you wait until at least the 20th of the month before reporting non-receipt of the current issue.

FOR SALE—LARGE STOCK OF AMERICAN and European Antique Arms. Send twenty-five cents in coin for our 12th edition catalog. We buy whole collections or single pieces. Fair prices paid. Kimball Arms Company, Woburn, Mass. tf

FOR SALE—GRIFFIN & HOWE DELUXE SHORT action Mauser 8¼ lbs., cal. 25 Remington 24" medium Poldi Anticorro barrel, 14" twist; genuine Circassion exceptional figure stock; hinged floor plate magazine; bolt handle knurled and engraved; receiver top fine knurled; engraved insert in floor plate. Two interchangeable caterpillar front sights, Lyman ½ minute rear with discs; q.d. fittings; half-rib integral English express sights; bolt tested 46-48 Rockwell A hardness; 120 fresh Hi-Speed cartridges, all excellent to perfect, shot 32 timed and accurate. Cost $425.00 will take $275.00 money order no trade. Bullet moulds new or only tried: MB-F257720, B-257693; Ideal 360271S; and MB-A358687—$6.50 each postage prepaid. Geo. N. Vitt, 242 Bradley St., New Haven, Conn.

FOR SALE—HEAVY 2R HI-SIDE WINCHESTER, excellent, ammunition, components, loading tools $95.00. Colt Official Police .22 perfect, ammunition $45.00. Stamp for details. J. J. Larson, Bellevue Ave., Yonkers, New York.

1903 SPRINGFIELDS, AS ISSUED, HEAT treated, excellent, $57.50, complete 1903 action and barrel, serial #660 excellent, trade for Officers' Model 45-70 Springfield or excellent British Lee-Enfield. R. Reppert, Rt. #4, Norristown, Penna.

FOR SALE—BROWNING SWEET SIXTEEN, made in Belgium, 26" modified ventilated rib, appearance excellent or better, otherwise perfect, 100 fresh factory loaded shells (your choice as to load), $175.00, L. C. Smith trap grade, 12x28, modified and full, Miller selective single trigger, automatic ejectors, (standard rib and forend), 100 fresh factory loaded shells, appearance excellent or better, otherwise perfect. $150.00. Baker double hammerless, 12x30, modified and full, appearance very good, otherwise perfect 50 fresh factory loaded shells, $45.00. Winchester model 97, 12x20 cylinder, appearance very good, otherwise perfect, 50 fresh shells, $45.00. Same but Marlin, 50 shells, $40.00. Remington double hammer, 12x30 modified and full (Modern Steel barrels), about v.g. 50 fresh shells, $30.00. Robert Haelig, Boundbrook, N. J.

THE REVOLVER TIMING RECORD—A 10 INCH RCA-Victor phonograph record. Practice timed and rapid fire anywhere. By Yourself. Nothing to watch—just listen. For dry shooting, basement and outdoor ranges. One side 10 second timing, other side 20 second timing. Plays on any phonograph, $1.50, postpaid. The Original Sight-Exchange, Box J, Paoli, Penna.

FOR SALE—MULTIGRAPH, MODEL 36, WITH printing attachment, type case, 11 fonts type, extra drum, drum stand, ribbons, blankets, quads, etc., power drive, hand feed, all in A-1 shape except composition rollers. $250.00 money order or certified check. Frank Dennis, Member, Hammondsport, New York.

Stith INSTALL-IT-YOURSELF MOUNTS

IF YOU'VE ASKED YOURSELF:

What Will A Scope Sight Do For Me?

HERE ARE THE ANSWERS:

- **Shows your target closer and clearer, with detail sharply defined.**
- **Increases visibility of target in dim light or against protective backgrounds.**
- **Gives you effective range not possible with iron sights.**
- **Equips your rifle with the most accurate of all sights.**
- **Minimizes eyestrain and increases your ease and pleasure in shooting.**

INSTALL-IT-YOURSELF MOUNTS ASK YOUR DEALER

STITH MOUNTS, in use on thousands of rifles, justify their reputation by giving service with scope sights, under all conditions.

The service you need from a mount, the service you get from a STITH MOUNT, means complete satisfaction to you.

ALL YOU NEED IS A SCREWDRIVER TO INSTALL IT

- **Rugged scope installation, for dependability.**
- **Scope protection, by means of the patented steel shield, and all-over sturdy construction.**
- **Personal attention to your needs, your preferences, and your individual problems.**

STREAMLINED MOUNTS WRITE FOR PRICES

M. L. & M. J. STITH • • 500 TRANSIT TOWER • • SAN ANTONIO 5, TEXAS

FOR SALE—COLT AND OTHER CAP AND BALL revolvers in shooting order, send stamp for list. Kimball Arms Company, Woburn, Mass. tf

FOR SALE—$1.50 SPRINGFIELD 30-06 RIFLE barrels, second hand, limited supply. Weil's Curiosity Shop, 12 Strawberry St., Phila. 6, Penna.

RELOADING SUPPLIES AND HANDLOADS. #57 primers for all Remington shotgun shells. $7.50 per 1000. Remington #11 percussion caps, $2.50 per 1000. Remington primers for .38 Special cartridges, size 1½, $5.00 per 1000. No c.o.d. shipments. Forward money with order for goods wanted. Public Sport Shops, R-75, 13 So. 16th St., Phila., Penna.

FOR SALE—SAVAGE MODEL 5 TUBULAR .22 caliber repeater, like new, $45.00. Nelson Manning, Millersville, Penna.

FOR SALE—REDFIELD JUNIOR MOUNTS FOR Springfield, Winchester, Mauser, Remington, Savage, etc., Weaver, $9.50, Alaskan—$11.50. Stith mounts $12.00. 10¢ postage. Weaver 330S scopes, $29.70, 440S—$35.20. Post or crosshair. 25¢ postage, insurance. Louis Ringuette, Grants Pass, Oregon. 3-45

PATENT PROTECTION—INFORMATION AND Invention Record free. Randolph & Beavers, 370 Columbia Bldg., Washington, D. C. 12-45

WANT A NEW GUN? THERE WILL BE A hundred anxious buyers for each new gun released after wartime manufacturing restrictions are lifted. Here's how you can insure being among the very first to get a new rifle, shotgun or handgun! Take advantage now of Klein's liberal Universal Gun Trade-In Priority Plan. How does it work? Simply trade in your used gun(s) and receive a registered, numbered priority certificate entitling you to a generous cash allowance against the purchase of any new gun and preference in delivery, the moment available, in accordance with priority number thereon. No red tape. No obligation. Everything to gain, nothing to lose. Certificate holder can cancel priority any time and receive immediate cash. Act today while used guns still command top prices. Send your gun(s) express collect for appraisal. If, by chance, our Trade-In Priority Offer does not satisfy you completely, your merchandise returned at our expense. Klein's Sporting Goods, 505TE South Halsted, Chicago 7.

FOR SALE—CUSTOM-BUILT SCHUETZEN style 22 L.R. target rifle Stevens 44½ action. Winchester 52 heavy barrel, full length forearm reversible prong buttplate, removable cheekrest, Lyman rear peep on extension, aperture front, single set trigger, excellent in and out, very accurate, $75.00. Winchester Model 86, 40-82, good in and out, $30.00. Tom Sharpe, Box 5117, San Antonio 1, Texas.

SPECIAL BARGAIN COMBINATION OFFER! "The Gun Digest," America's newest gun book sensation, plus Klein's 8-page Bargain List of available new and used guns only $1.00. "The Gun Digest," not a reprint edition, catalog or pocket handbook, but the largest, most fascinating, informative, all-inclusive volume of its kind in publishing history! Every current U. S. rifle, shotgun, handgun fully described (all specifications included), brilliantly illustrated. Chock-full of the how, why, when and where of hunting and shooting right from 14 famous gun experts. 25 complete sections! 629 top-notch illustrations! Send $1 (plus 10¢ for postage, handling). Money-back guarantee. Klein's Sporting Goods, 505E South Halsted, Chicago 7.

FOR SALE—38 S&W REVOLVER, 40 ROUNDS, very good, $30.00. 2-horse Neptune outboard, good condition, used very little, $70.00. WANTED TO BUY—Six Krags, two Mexican Mausers 7mm, Two .30-30 carbines, six .22 rifles, very good. Coy Poe, 815 St. Augustine Street, Houston 3, Texas.

FOR SALE—SPECIAL—MEN'S WRISTWATCH straps—genuine leather, $2.00 value, all widths, 3/16, ⅜, ½, ¾"—tan, black, mahogany, $1.00 each, postpaid, special price to dealers in dozen lots. Leather Specialties, 1840 Gladstone St., Phila. 45, Penna. 2-45

NEW WINCHESTER-ENFIELD BARRELS FITted to Mauser action, feed clip, magazine altered, stream-line trigger guard $20.00. NEW LIST FREE: Flaigs Hunters Lodge, Millvale, Penna.

FOR SALE—32 COLT AUTOMATIC, LIKE NEW, pearl stock, holster, $45.00. Joe Mupp, Ewing, Nebraska. 2-45

ATTENTION—HORNETT-LOVELL FANS! FEW Winchester h.w. single-shots with Winchester Standard 52 barrels available in Spring. $80.00, $25.00 with order. Some ammunition available. Paul Ratliff, Hillyard, Washington. 2-45

FOR SALE—REMINGTON MODEL 14 CARBINE, .32 caliber, very good, $78.50. Nelson Manning, Millersville, Penna.

FOR SALE—500-38 SPECIAL HANDLOADS IN new cases, $4.00 per hundred. Ray Seay, Lake City, Iowa.

FOR SALE—AMMUNITION AVAILABLE TO qualified purchasers. List 10¢. Rudolph's, Atchison, Kansas.

SELL—WINCHESTER MODEL 07 CALIBER .351, box ammunition, all perfect, $90.00. E. E. Smallwood, Bloomington, Indiana.

ADULT BOOKS FOR YOUR PERSONAL LIbrary. Illustrated sample and catalogs, 10¢. Alstone, 304, Lunenburg, Mass. tf

FOR SALE—ONE PACIFIC LOADING TOOL, with carbon steel dies and primer feed for .38 Special (like new.) One Ideal lubricator and sizer (.357) like new. One Moder-Bond-Two Cavity Mould, Resser bullet, 150-grain, new. 36 lbs. moulded 146-grain Hensly wadcutters, some sized and lubricated. 50 to 60 lbs. of .38 Special cases (never have been re-loaded). With this I will throw in a home-made powder measure, a set of Resser blocks with one ring out, makes 160-grain bullet, and about a half can of #5 pistol powder. Will gladly answer any question or furnish more details. First M.O. or check for $60.00 (sixty dollars) gets the lot, prepaid. John Craig, % U. S. Customs, Champlain, N. Y.

FOR SALE—INDIAN RELICS, CONFEDERATE bills, coins, minerals, gems, fossils, crystals. Illustrated catalog, 5¢ 100 ancient arrowheads, $3.00. H. Daniel, Hot Springs, Ark. tf

FOR SALE—REVOLVERS, MINERALS, STAMPS, coins, glass, Indian relics, Catalogue 5¢. Cowboy Lemly, Las Cruces, New Mexico. tf

INDOOR TARGET CARRIERS—FOR CLUB, POlice, or school ranges. Trolleys are packed in units of two, consisting of: eye bolts, nuts, pulleys, rubber stops, screw hooks, 16" sheave wheels, bearing plates, set screws, washers, wing nuts, galvanized wire, braided cord, crank shafts, and round head screws. Ready to install and packed two in a crate. Priced only $5.00 per pair. F.O.B. National Rifle Association, Washington 6, D. C. tf

JOHNSON AUTOMATICS

Producers of the

JOHNSON SEMI-AUTOMATIC RIFLE

and the JOHNSON LIGHT MACHINE GUN

CUSTOM GUN REPAIR DEPARTMENT

Due to the recent changes in War Production requirements, we have found it necessary to curtail substantially the activities of our recently announced Custom Gun Repair Department. However, we remain in a position to give a limited amount of service. Inquiries will be answered promptly.

Full custom gun repair service will be furnished as soon as circumstances permit.

Write for further details and free illustrated folder of the military arms we are now supplying to the armed forces of the United Nations.

JOHNSON AUTOMATICS

Dept. R

PROVIDENCE 1, RHODE ISLAND

CASEWELL TARGET CARRIERS GIVE THE shooter every possible point because they hold the target steady and require no exertion to operate. Fully equipped with speedy ball-bearing pulley wheels and target holders for every type of indoor paper rifle or pistol targets. Caswell Target Carriers, Anoka, Minnesota. tf

PREHISTORIC STONE TOMAHAWK, 75¢. 100 good prehistoric arrowheads, $3.00. 10 tiny perfect bird arrows, $1.00. Spearhead 25¢. List free. Caddo Trading Post, Glenwood Arkansas. tf

FOR SALE—COLT AND REMINGTON CAP AND ball revolvers, muzzle loading rifles, etc. A request brings list. E. C. Ward, 406 Wilcox Bldg., Los Angeles 12, Calif. 2-45

FOR SALE—AUTO BURGLAR ALARMS. FOOLproof, reliable, easy to install. Fits all cars, $2.00. Penn Auto Stores, 22 S. Main Street, Marsfield, Ohio. 5-45

FOR SALE—DUPONT, HERCULES, UNERTL, Fecker, Weaver, Redfield, Stith, Sisk. Stamp for folder. Louis Ringuette, Shooters' Equipment, Grants Pass, Oregon. 3-45

FOR SALE—PERCUSSION CAPS—BLACK POWder—bird & buck shot—flints—we stock them all. #11 Remington caps, $2.85 per 1000—express collect. Black powder F, FF or FFFg in 6¼ lb. cans, freight only—$4.00; 25 lbs. $12.50. Bureau of Mines license required. We endorse, record and return this document. Bird and Buck Shot allotment exhausted for first quarter. MINIE BULLETS: .575, lubricated $3.25 per 100. POWDER MEASURE CHARGER, with funnel, adjustable from zero to 100 grains, $3.50. NIPPLE WRENCHES: Pistol, rifle, musket, 75¢ each. ENGLISH FLINTS: pistol, rifle or musket, $1.10 per dozen. BOOKS: Roberts' 2nd Edition Cap Lock Rifle, $6.00. Cline's MUZZLE LOADING RIFLE, $7.00. BAXTER'S FOR BEGINNERS ONLY, 85¢, each dealing with muzzle guns. Join THE NATIONAL MUZZLE LOADING RIFLE ASSOCIATION and receive monthly 20-24 page publication—MUZZLE BLASTS. Fee for both $1.50 per year. Learn about the revival of interest in the early guns of our nation. E. M. Farris, Secretary, RR YMCA, Portsmouth, Ohio. tf

GIANT CHINCHILLA RABBITS. VALUABLE fur. Delicious meat. Easily raised. Pleasant pastime. Tremendous demand. Small investment. Large profit. WILLOW FARM, R82, Sellersville, Pa. tf

FOR SALE—RARE OFFICER'S MODEL, 2R Sharps-Borchardt, Walnut side pannelled action, original heavy 27½" barrel, lined, chamber and action modernized by Gebby; Litchert's Eagle Varmint 8X scope, Lee ¾" Dot, Dehorned mounts, rifle very accurate and in crank condition, $250.00. M.70 stock, rubber butt plate excellent $15.00. M. O. Please. R. P. Dudley, Member. Box 214, Bridgewater, Virginia.

SPRINGFIELD STRIPPED RECEIVERS, HEAT treated $9.00 each, as issued $7.50 each. Stripped trigger guards $3.60, followers $1.00, floor plates $1.25, magazine springs 75¢, cocking pieces 75¢. 45¢ auto parts: extractor 85¢, firing pin 35¢, firing pin spring 25¢, hammer $1.50, sear $1.00, stock screws 25¢ each. No order less than $1.00, please. All prices f.o.b. Phila. E. S. Burrell, 717 Wyndmoor, Phila. 18, Penna.

FOR SALE—COLT POLICE POSITIVE, .38 SPECial, 5" barrel, pearl grips, very good. One box ammunition, $35.00. George Seacat, Ashland, Kansas.

FOR SALE—DUPONT POWDER NOS. 4227, 4320, 4064, 4198, 3031 and 4350, per pound canister, $1.60. Nos. 4759, 6, bulk shotgun and MX, per 8 oz. canister, $1.00. Black Powder, Fg, FFg, and FFFg, per 6¼ lb. keg, $2.50; per lb. canister, 60¢. Hercules powder, Nos. 2400, HiVel No. 2, Lightning and Sharpshooter, per lb. canister, $1.60. Unique, Bullseye and Red Dot, per 8 oz. canister, $1.00. Eureka Powder and shot measures, 35¢ each. Write for complete stock list. Belding & Mull, Philipsburg, Penna.

FOR SALE—WINCHESTER 94, .32-40, VERY good, takedown, 5 shot magazine, Lyman tang sight, canvas case, 25 cartridges. 32 Long supplementary chamber, $55.00. Gordon E. Morlang, 115-18 224th St., St. Albans, New York.

FOR SALE—70 WINCHESTER .257 STANDARD, 48 WJS, Pacific Dies, empties, handloads, comm. loads, bullets, very good to excellent, $100.00. Dr. C. W. Ellis, Quincy, Michigan.

FOR SALE—EXCELLENT .38 SUPER, LIKE new, 100 cartridges, $90.00. Extra cartridges for sale. B. Rafalke, 6605 Dellbank Drive, Cleveland, Ohio.

FOR SALE—2R LOVELL ON REMODELED KRAG action, 6X Unertl scope, 50 loads, very, very good, $100.00. David Hall, 703 Elm St., Martins Ferry, Ohio.

FOR SALE—GOOD .45 COLT AUTOMATIC WITH ammunition, $57.00. Excellent .32 Savage Automatic pistol, holster, shells, $35.00. Good 6½" Colt .22 Automatic, Heiser hand carved holster, ammunition, $60.00. Will consider trading for .30-'06 rifles. Forrest Weeks, Belle Fourche, South Dakota.

AUTOGRAPHED COPIES—"HAND CANNON TO Automatic"—Over 200 pages of interesting, educational and pictorial information on the development of hand arms. Price $5.00 per book postpaid. Order direct from the author. Herschel C. Logan, 400 So. 9th St., Box R, Salina, Kansas. 2-45

FOR SALE—WINCHESTER MODEL 70, SUPERgrade .30-'06, factory new, never fired. This superb gun equipped with Zeiss Zielklein scope; G&H ultralow micrometer mount installed by Griffith & Howe. Bolt handle altered; bolt knob checkered; bolt follower and extractor burnished; front sight cover. All work done by G&H. Sheeplined cover and 200 rounds ammunition. First Money Order, $295.00. Member. Jule Miller, 1401 Arcade Bldg., St. Louis, Mo.

FOR SALE—MATCH TARGET WOODSMAN NO. 6697. Red-head holster. 2,000 Long Rifles. Fired fifty rounds. Factory perfect, $120.00. New prewar size 40 tuxedo, $20.00. Lyman Super Targetspot 15X, new model, latest Lyman mounts, excellent, $120.00. Lyman Targetspot 8X, new model, latest Lyman mounts, excellent, $90.00. Money orders. Lt. Comdr. Hugh Kelly, Saunderstown, R. I.

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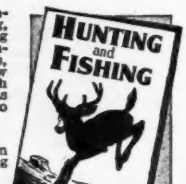

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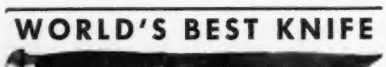

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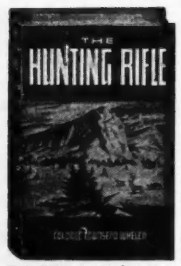

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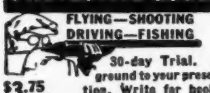

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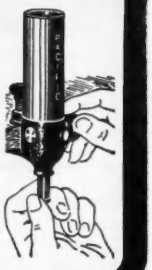

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SELL OR TRADE—50, .45 CALIBER AUTOmatic cartridges, $2.69, 1000, improved 6½ Western primers, $15.00, 200, 40 gr. .22 caliber prewar Sisk Express bullets, $5.00, 100, Peters .38 Special, $3.32, 100 Kleanbore .38 Special, $2.80, Colt D.A. 41 Cal. 3½" very good, $30.00. S&W .32 Hammerless, very good to excellent, with cartridges, $30.00. Want Weaver 330 B mounts, inletted Mauser stock Bishop or equal, excelent 8mm. or 30-06 barrel or what have you. H. I. Nichol, R.D. #1, Conklin, N. Y.

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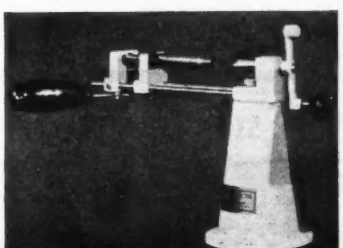

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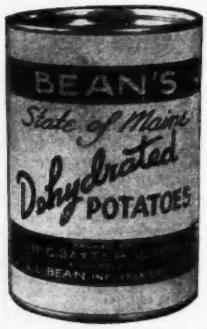

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WANTED — 20 GAUGE REMINGTON OR Browning automatic in excellent condition. J. M. Brooks, Falfurrias, Texas.

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WANTED—REMINGTON .380 AUTO PISTOL, perfect, also want Bausch & Lomb Ray Ban sun glasses. J. Eldon Bustard, 3334 Campbell, W. Dearborn, Michigan.

WANT— WINCHESTER MODEL .70 CALIBER .270, excellent condition with some ammunition, also Winchester Model .52 sporting rifle. John DiMaggio, Morgan City, Louisiana.

WANTED—MODEL 70 HORNET EXCELLENT, with factory ammunition. Carl Wicher, 1435 Division St., Camas, Washington.

WANTED—MODEL 7—SWIFT TARGET ONLY, excellent to perfect, ammunition. Albert Slocum, Greenwich, New York.

WANTED—ITHACA DOUBLE 12 GAUGE, 28" cylinder, full, ejector, single trigger, perfect. Cash. Edward Johnson, R.F.D. #1, Sparta, Wisconsin.

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WANTED—.44-45 FRONTIER COLTS OR REMington. Robert Abels, 860 Lexington Ave., New York 21, N. Y.

WANTED—LUGER & MAUSER PISTOLS, MUST be in excellent condition, interested in unusual models. W. A. Brown, 98 Phillips Ave., Swampscott, Mass.

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WANTED—MODEL 70 WINCHESTER .270, EXcellent or better. Pacific loading outfit complete for .220, .250 and .270. Automatic shotgun with Skeet or modified barrel, 20-gauge. J. E. Fraley, Box 177, Converse, Indiana.

WANTED—PACIFIC OR SCHMITT M12 REloading tools, .250-3000 Pacific scale, powder measure. Henry Adolphi, 77-D McNeal, Bremerton, Washington.

WANTED—.22 CONVERSION UNIT FOR LUGER pistol. W. A. Brown, 98 Phillips Ave., Swampscott, Mass.

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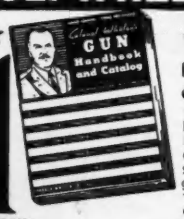

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WANTED—.22 TARGET PISTOL, WRITE Details. Gary Baumgardner, 624 No. State St., Tacoma 6, Washington.

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WANTED—PERFECT .220, M70 TARGET GRADE only, Pacific dies, components, perfect standard Browning O&U 12 ga., 28", M&F; state times fired, complete details, perfect Lyman All-Weather Alaskan, G&H QD mount for M70. Lt. Learned, 553 West Park, Ottumwa, Iowa.

WANTED—4X RIFLE SCOPE, HENSOLDT DIAlytan, Zeiss Zielvier, Luxor-Hall or Ajack. M. E. Hutton, 222 South Mariposa Ave., Los Angeles California.

WANTED—FREE PISTOL, .22 CALIBER RECord Match or Luna preferred, will consider others, must be good to perfect, will pay fair price. Harold Kent, 27 Broadway, Lawrence, Mass.

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WANTED—PACIFIC TOOL COMPLETE WITH dies for 30-06, 220 Swift, Pacific powder scale B&M No. 28 tool complete for 30-06 state condition and price. S. W. Gall, 4231 Langland, Cincinnati 23, Ohio.

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WANTED—SEVERAL .22 CALIBER TOPBREAK revolvers, condition of barrel immaterial, .22 caliber shot cartridges any quantity, snow shoes. R. Kirk, Ridgway, Penna.

WANTED—MODEL 63 WINCHESTER, EXCELlent condition, also 218 Bee and S&W 38 short centerfire shells. Eddie Kienholz, Fairfield, Washington.

WANTED—HORNET RIFLE, 20 GAUGE DOUble, Winchester 62, Remington 32 pump, ammunition immaterial. John Borland, Emlenton, Penna.

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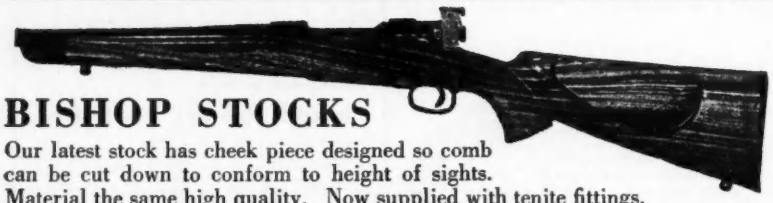

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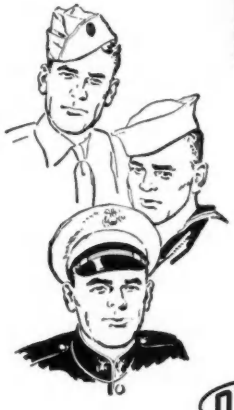

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